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CONTENTS.

Steel Production Increasing 295
Relative Tonnages of Finished Products 296
Correspondence 297
The Industrial Campaign Against Sickness 297
Ventilation in Factory Heating 297
Railroad Equipment Orders 298
Death of John W. Gates 298
Obituary 299
July Pig Iron Production 300
The Lake Superior Mining Institute 301
The Iron and Metal Markets 302
The Steel Corporation Investigation 313
A Scottish Tube Works Consolidation 317
June Iron and Steel Exports and Imports 317
New Officers of Westinghouse Electric & Mfg. Company 318
July Copper Production and Stocks 318
Labor Notes 318
Personal 319
New Scheme for Storing Exhaust Steam 319
Pig Iron Cost at One Southern Plant 319
Production of Pig Iron in the United States in the First Six Months of 1911 320
A Special Coal Handling Crane 321
The General Refractories Company 323
Another Italian Steel Combination 323
The Wire and Horseshoe Pool Cases 323
Papers on Fuel Oil 323
Acid and Basic Open-Hearth Steel 324
Nickel Steel 326
A Grinder for Planer Cutters 327
The Knight Gasoline Engine 328
New Thomson Electric Welder 329
Pattern Handling in a Steel Foundry 330
The Newton Combination Portable Boring, Drilling and Milling Machine 331
Minnesota Steel Company Blast Furnaces 331
A Replaceable Unit Electric Furnace 332
Growth of Engineering Societies 332
New Model of O'Kelly Speed-Reducing Gear 333
The Corona Drill Socket 333
A Corporation Recipe 333
The Caterpillar Traction Engine 334
An Electrically Operated Stop Valve 335
Official List of Machine Tool Builders 335
New Brace Miller 336
Hours and Wages in the Iron Industry 336
The Machinery Markets 337
Government Purchases 345
Judicial Decisions of Interest to Manufacturers 345

Steel Production Increasing

A Gain in Unfilled Orders

Merchant Pig Iron Stocks and Output Reduced

While the market for steel products cannot be called active, the fact remains that the large steel companies, with perhaps one or two exceptions, are operating a larger percentage of finishing capacity than at any time this year. The Steel Corporation, which, as already intimated, may be doing a little better than some of its competitors, is now producing ingots at an 80 per cent. rate. Its shipments and new orders in July exceeded those for any other month of the year and it is expected that the tonnage statement of August 1, to be published August 10, will show a net gain of 250,000 tons in orders on the books.

Our pig iron statistics show that the July production, apart from charcoal iron, was 1,793,068 gross tons or 57,841 tons a day, against 1,787,566 tons, or 59,585 tons a day, in June. The banking of many furnaces on both July 3 and 4 accounts for the falling off last month. Thus August, with daily active capacity of 59,990 tons at the opening of the month, against 59,979 tons on July 1, should show a considerable gain over last month.

Standing alone the figures do not give the real story of what is going on in pig iron. It needs to be said that while 197 furnaces were active August 1, or 1 less than on July 1, the list of steel works furnaces in blast made a net gain of 5 in the month, while the merchant list had a net loss of 6. Merchant stocks were reduced in eastern Pennsylvania, Virginia, the South and in most other districts last month, so that the situation in foundry iron is veering toward the seller's side.

The firmer attitude of Southern furnaces has resulted in an advance of 25c. in some markets on deliveries running through the year, though the $10 price for prompt shipment has not entirely disappeared.

In the central West the chief transaction was the buying of 12,400 tons by a large Pittsburgh interest for its foundries in the Pittsburgh and Cleveland districts. The prices reported were on a Valley basis of $13.50 for No. 2 for the last quarter of this year, and $13.75 for the first quarter of 1912.

The position of Eastern pig iron producers has stiffened in view of declining stocks and production both in Virginia and eastern Pennsylvania. Some sales from both districts have been made to pipe makers, who are ready to take more if it can be had at recent prices, but sellers are not anxious for such business. As a rule, also, they are staving off inquiry for 1912, which is occasional and scant.

Some business has been done in basic in the East and at Pittsburgh. A sale of 10,000 tons was made to a foundry in the Shenango Valley at $13 delivered, the freight being 40c., but $13 is now regarded as

the Valley price. An Eastern steel company is sounding the market on 25,000 tons of basic iron for the first quarter, but sellers will not consider $15 delivered.

A 2000-ton sale of ferromanganese has just been made at $37, Baltimore, delivery through most of 1912, and a 500-ton inquiry is pending. The total movement in recent weeks, including the tonnage closed before the advance in price, is put at 6000 to 8000 tons.

An inquiry for 5000 tons of billets for a railroad supply company has come up in the East and may at least serve to test that market.

Railroads continue to succeed well in deferring car and rail buying. The Atlantic Coast Line has placed 1000 cars and various inquiries are still out on 12,000 to 14,000 freight cars. One sale of 20,000 tons of rails was virtually closed this week.

The structural situation is more promising. In New York 16,000 tons of steel for the subway extension has been closed on the Bradley contracts. For the Filene Building at Boston 6000 to 8000 tons will be required. The Point bridge at Pittsburgh, 5000 to 7000 tons, will probably be let this month. For several Western roads 3000 tons of bridge work has been taken at Pittsburgh.

In metals the features are the more favorable showing of the copper statistics, the more marked shortage in pig tin, resulting in a premium of ¼c. on sales of spot in New York, and the advance in spelter to 6c., New York, the high point of the year.

Relative Tonnages of Finished Products

It is often remarked that since 1907 the railroads have been very light buyers of iron and steel products and that in consequence the distribution of tonnage among the different rolled forms has been materially altered. A study of the detailed statistics for 1910, which have become available in the past fortnight, supports this conclusion only in slight degree. While it is undoubtedly true that since 1907 the railroads have taken a much smaller proportion of the total product of the iron and steel industry than they did in the years of heavy expansion, 1905-6-7, the distribution of the tonnage among the different rolled products has not greatly altered. There have been, however, a number of cross currents of considerable interest.

One may well take the year 1906 as representing the crest of the wave of railroad demand. There had been heavy buying of rails, cars and locomotives in 1905, and this buying continued through 1906, while buying in that year was very heavy. In 1907 buying was not so heavy but orders were still being filled, as the mills entered the year with much rail tonnage booked and the car and locomotive shops were very well filled with orders. Comparing the years 1906 and 1910, the percentages work out as shown in the table herewith. This covers the total of rolled iron and steel, weighed, generally speaking, in the form in which it left the last hot rolling, so that structural shapes are represented rather than finished structural work, black plates for tinning rather than tin plate, rolled forging blooms and billets rather than finished forgings, rods rather than rod billets or drawn wire, skelp rather than pipe, and so on.

Of the total of rolled material in 1906, 11.2 per cent. was rolled iron and 88.8 per cent. rolled steel. In 1910 8.1 per cent. was rolled iron and 91.9 per cent. rolled steel. There was an increase in total rolled iron and steel from 1906 to 1910 of 11.1 per cent., there being an absolute as well as a relative decrease in the tonnage of rolled iron.

Production of Rolled Iron and Steel, Gross Tons and Relative Percentages.

	1906		1910	
	Tonnage.	Per cent.	Tonnage.	Per cent.
Rails	3,977,887	20.4	3,636,031	16.8
Structural shapes	2,118,772	10.8	2,266,890	10.5
Plates	2,531,552	13.0	2,807,728	13.0
Sheets	1,074,525	5.5	1,435,619	6.7
Black plates	576,079	2.9	712,137	3.3
Nail plate	54,211	.3	45,294	.2
Wire rods	1,871,614	9.5	2,241,830	10.3
Forging blooms, etc	206,110	1.0	459,933	2.1
Merchant bars	3,992,200	20.4	3,785,731	17.6
Reinforcing bars	.....*	...	241,109	1.1
Skelp, flue, etc	1,528,585	7.8	1,828,194	8.5
Splice bars	224,911	1.1	223,022	1.0
Hoops	172,332	.9	262,214	1.2
Bands and cotton ties	408,018	2.1	424,979	2.0
Sheet piling	.....†	...	26,598	.1
Railroad ties	.....†	...	49,048	.2
All other	851,672	4.3	1,174,922	5.4
Total	19,588,468	100.0	21,621,279	100.0

*Included in merchant bars.
†Included in structural.

From the increase in the total in the four years it follows that any line which showed unchanged percentage in the two years compared increased its tonnage by 11.1 per cent. Comparing the percentages, as shown in our table, it appears that rails dropped from 20.4 to 16.8 per cent., decreasing absolutely as well as relatively. This loss has been generally recognized. The railroads were wearing out rails faster in 1909 and 1910 than in 1906, because freight traffic increased slightly, and the laying of new track showed no decrease, but in 1906 there was considerable replacement of old light rails with modern heavy sections, calculated to bear the much heavier trains and greater speeds involved, as compared with conditions when the light rails had been laid many years earlier, and it is this which has made the decrease in tonnage.

Structural shapes apparently decreased from 10.8 per cent. in 1906 to 10.5 per cent. in 1910, but in the latter year sheet piling, one-tenth of 1 per cent., and railroad ties, two-tenths of 1 per cent., were separated, whereas in 1906 they were included with structural shapes. If those percentages be added for 1910 the proportion of structural shapes is found unchanged, so that there was an increase in tonnage substantially the same as the increase in all rolled steel from 1906 to 1910.

Plates are found to be unaltered in proportion, while both sheets and black plates for tinning show a material increase in the proportion. Rods show an increased percentage. It is of interest here to note that the 1910 rod tonnage was less than the 1909 rod tonnage, whereas the total rolled iron and steel increased from 1909 to 1910. Accordingly, rods showed a still larger percentage of the total in 1909 than in 1910, even though 1910 shows a material gain over 1909.

Contrary, perhaps, to what is usually assumed, merchant bars have shown a relative decrease. In 1906 concrete reinforcing bars were included with merchant bars, while in 1910 they were segregated. In 1910 the proportion of merchant bars alone was 17.6 per cent. and of concrete reinforcing bars 1.1 per cent., the total being 18.7 per cent., which compares with 20.4 per cent. in 1906. Skelp shows a slightly increased proportion, splice bars a slight decrease, quite natural considering the decrease in rails, while hoops show a slight increase and bands and cotton ties a slight decrease.

On the whole, there have been no decreases in the proportions worth mentioning, except in rails and merchant bars. The losses in these lines have been made up by increases in sheets and black plates, rods and skelp, other lines being practically unchanged.

The Industrial Campaign Against Sickness

The British government, under its proposed national insurance act, plans to carry out a universal campaign against sickness, doing in a thoroughly organized manner what many American manufacturers have been accomplishing as individuals. The act will establish in every county a local health committee, the duty of which will be to carry on a campaign of education through lectures and publications on hygienic topics, and also to exercise a general supervision over sanitary conditions as they exist in the various communities. Medical attendance in sickness for the entire body of the working classes will be provided. At present a very large number of these people enjoy this benefit through membership in the so-called friendly societies, which have their counterpart in a great many industrial establishments in this country, but a very large class exists outside of such associations. Free medical treatment, which may be compulsory, should play no inconspicuous part in increasing efficiency through minimizing the percentage of producers who are incapacitated.

Especially important is the provision which has to do with tuberculosis. Millions of dollars a year will be set aside for the maintenance of sanatoria where cases of consumption will be isolated and the victims treated, in many cases successfully, no doubt, which will be in sharp contrast to the impossible conditions which usually surround them at the present time.

The movement against tuberculosis in American factories has made enormous progress since its inception a few years ago. From a beginning in a few cities it has spread all over the country. Though by no means universal, the promise is that it will be practically so even without the assistance of governmental compulsion. In hundreds of large establishments free expert medical examination is given in every case where suspicion of the disease exists. If the individual manifests unwillingness to submit to the examination, he is generally compelled to follow the rule on penalty of dismissal. When the disease is found the effort is made to place the patient where recovery may be hoped for. If there is a sanatorium in the territory the means are usually provided for placing the patient there, and, at least, outdoor employment is substituted for that within the shop, to the probable improvement of the victim and the freedom from contagion on the part of his associates in the works.

The most essential element in combating disease is striking at its inception by making conditions sanitary in every possible way. The strides taken toward this end have been almost unbelievable. One has to go back but a few years to see almost the opposite extreme, that of indifference and ignorance as to means of maintaining the health of working people. Ventilation, lighting, plumbing, the handling of dangerous gases and materials, all these and other elements of sanitation were given hardly a thought. Coupled with wise laws compelling the enforcement of sanitary regulations, the enlightenment of employers has been rapid, one may say spontaneous. The motive is a dual one. Most owners feel an increasing responsibility toward their employees, but they also realize more thoroughly than of yore that working people can produce much more efficiently in surroundings that are conducive to good health and good spirits.

Ventilation in Factory Heating

The widespread use of the fan system of factory heating has doubtless often suggested that it was selected for its seeming potentialities in ventilation. As a matter of fact the ventilating feature has been a secondary consideration, heating by the circulation of air proving attractive from the standpoints of first cost and of satisfactory performance. It is not uncommon to find such heating systems arranged to accept air from the shop interior, this air to be forced by the fan through the distributing duct system over and over again. The premeditated attempt to circulate the air within the shop has undoubtedly caused many a shock to students of the humanitarian side of shop conditions. It has its parallel in the housewife who is very much exercised on one's suggesting a recirculation of air even for a part of the time in a warm-air furnace heating system and who is yet not concerned if a room is warmed by means of direct radiators without apparent means for the replenishment of the air.

It is reasonable to believe that ventilation may be defined before long, in terms not of the pure air supplied per indiviual or per unit of time, but of capacity to maintain a freshness of indoor atmosphere and thus a condition of atmosphere calculated to make the subject comfortable. It is obvious that this means that the temperature shall not be so low that one is chilly nor so high that he is overheated; that there shall be a water vapor content not so low as to superinduce excessive evaporation from the skin nor so high as to interfere with the evaporation necessary to dissipate the heat developed by the human body. To these desirable requirements has lately been added the notion that freshness is obtainable by movement or currents of air and is not realized with air in a stagnant condition, no matter how well the temperature and humidity limitations are met. Naturally, air contaminated with disease germs or with odors of a disagreeable sort is not to be permitted. But if the manufacturing processes do not develop obnoxious odors, if the workers are not excessively crowded, if the general conditions are attractive and if there is abundant sunlight illumination, propagation of disease is minimized notwithstanding recirculation; and there is the added feature that the fan system permits of maintaining temperature and humidity and of providing the degree of freshness regarded so important.

Of course, it must always be recognized that building materials have a high degree of porosity, particularly those used for industrial works, and there is always a large dilution of indoor air by leakage. It may be added that where conditions are unusually trying it is possible to install filtering arrangements, such as air washers, which may be made to catch bacterial and dust impurities and control humidity. In short, if the present knowledge of the subject shows anything, it is that the recirculating system is nothing to be feared.

Correspondence

Bonuses and the Location of Industries

To the Editor: Your editorial "Two Problems of Factory Building" in the August 3 number of *The Iron Age* is exactly right. You are not laying down an "extreme ruling" when you say that the only thing to be considered in choosing the site of a manufacturing enter-

prise is its adaptability to the enterprise, all things considered, regardless of so-called inducements. Of course, as between two or more cities where all other things are equal, such as proximity to raw materials and selling markets, transportation facilities, labor supply, banking accommodations and residential advantages, the enjoyment of a free site, or a building, tax exemptions or the like, would be influential; but that does not in the slightest degree alter the principle which you lay down, because in such cases the "inducements" do not displace the more essential factors.

Commercial secretaries of experience almost without exception agree unqualifiedly with your proposition. The American Association of Commercial Executives in its convention at Grand Rapids, Mich., last October debated a resolution condemning the giving of bonuses and, to the extent that it expressed the personal convictions of the members present, it was adopted without a dissenting vote. The association has a standing committee whose duty is to promote the adoption of a uniform policy for all commercial organizations upon this matter.

Leaving out companies promoted either by their originators or, more frequently, by professional business brokers, for the sole purpose of obtaining a bonus (and the number of such is vastly greater than is suspected by the average man who is not directly connected with town development work), the concern whose originators can be induced to choose a location solely or largely by gratuities is on the road to quick disaster. That sort of judgment is not of the caliber required for business success. Indeed, most of these enterprises are undertaken by men of so little experience in administration that they are apt to make no inquiries whatever about freight rates and other fundamental and essential factors. Any commercial secretary's files are full of letters (if he encumbers his files with them at all) in which the only query is, "How much will you give us?" without a question for information about commercial possibilities.

On the other hand there is similar inexperience or lack of judgment on the part of the town boomers. The bonuses are offered in every instance by town booming organizations which are very new and very short-sighted and which are totally ignorant of the experience of other localities and of the true principles of industrial expansion. Neither do they realize that nothing on earth makes citizens "sore on the town" and discourages them from lending proper encouragement to a legitimate enterprise like an empty factory building or two standing as a constant witness to ill-advised attempts at booming. Such organizations are the prey of the professional business brokers. Better have no factories at all and remain a rural community than to be a rural town with a few gaping buildings and smokeless stacks cluttering up the landscape.

ERNEST H. ROWE,
Secretary, Chamber of Commerce.
Uniontown, Pa., August 4, 1911.

Railroad Equipment Orders.—Contracts for cars and locomotives have recently been placed as follows: The Grand Trunk, 10 compound consolidation locomotives; Chilean State Railways, 288 freight cars; Havana Central, 360 60-ton box cars. There are inquiries in the market for 100 refrigerator cars for the Atlantic Seaboard Dispatch; 15 consolidation and 5 switching locomotives for the Wabash; 25 steel underframe coaches and 25 express cars for the Grand Trunk and 1,000 box cars, 500 stock cars and 400 automobile cars for the Missouri Pacific.

The new furnace testing laboratory of the Electric Furnace Company, Alliance, Ohio, will be completed about August 15. The building is located on a tract of land secured from the Stark Electric Railroad Company, near Alliance, and power for testing purposes will be received direct from the railroad company's busbars. The plant will be supplied with a 200 k.v.a. Westinghouse special regulating transformer, a complete set of electrical recording and indicating instruments, pyrometers for temperature determinations, a small chemical laboratory, and equipment for microscopic examination of metals. The Electric Furnace Company has developed a line of electric heating furnaces for forge shops and similar plants, and the new laboratory is to enable it to test new types of furnaces that are being called for.

Death of John W. Gates

After battling for weeks against a serious complication of diseases which at the last developed pneumonia, John W. Gates died in Paris early Wednesday morning, August 9. A strong constitution and his courageous resistance, backed by every resource of medical science, prolonged his life for days after his case had been considered critical. His death removes one of the most prominent figures in the American iron and steel trade of the past 25 years. The fields of his operations have been much broader than the iron industry, but it was in the latter and particularly in that branch of it taking in all forms of wire manufacture that his influence was most conspicuous. As is well known, Mr. Gates was also a figure of national importance in railroad and security operations, and in more recent years he has been prominently connected with oil developments in Texas. One of the most daring, and in many respects one of the most capable, business men the country has ever known, his rise to prominence was largely based upon his remarkable equipment for salesmanship.

He was born May 8, 1855, in Du Page County, Ill., and was the son of a farmer. He was educated in district schools, attended Wheaton College at Wheaton, Ill., and

JOHN WARNE GATES.

graduated from Northwestern College, Naperville, Ill., in 1873. He first embarked in the grain business at Turner, now West Chicago, Ill. Selling out in 1875 he opened a hardware store there, this early business venture showing him to be a man of keen business sense with an unusual capacity for trading and an ambition for large operations. Feeling that he had little chance in so small a town, he decided to become a traveling salesman and went to Texas to sell the newly invented barb wire, then being placed on the market by Isaac L. Elwood, of De Kalb, Ill. His success in inducing the ranchmen to make large purchases of barb wire was remarkable. He decided to engage in barb wire manufacture on his own account, and established at St. Louis the firm of J. W. Gates & Co., which became, in 1881, the Southern Wire Company, of which he was president. Others connected with this company were Alfred Clifford and William Edenborn, who also became prominent in the wire trade. He and his associates formed the Braddock Wire Company in 1884 and built a plant near Pittsburgh. He was less than 30 years of age when he organized the Southern Wire Company. The Braddock plant gave the company its own wire, whereas previously it had purchased wire and barbed it. About the time of the building of the Braddock plant, Mr. Gates bought the Iowa Barb Wire Company, which had a plant at Allentown, Pa., and became vice-president. Then he secured an interest in the St. Louis Wire Mill, of which he also was made vice-presi-

dent. Later he and his associates bought into the Baker Wire Company, Lockport, Ill. In 1891, through Mr. Gates's efforts, the Columbia Patent Company was formed. It sold about 95 per cent. of the entire barb wire product of the country under his direction as general manager. However, a few of the smaller makers withdrew after several months.

In December, 1892, Mr. Gates was prime mover in forming the Consolidated Steel & Wire Company, capital $4,000,000, taking over the St. Louis Wire Mill Company, the Iowa Barb Wire Company, the Lambert & Bishop Wire Fence Company, the Braddock Wire Company, the Baker Wire Company and the Freeman Wire & Iron Company. In this consolidation John Lambert became prominent. Mr. Gates held the position of general manager until April 6, 1893, when he resigned.

In 1894 he was active in forming the American Steel & Wire Company of Illinois. In 1895 he was asked by the principal owners of the Illinois Steel Company to become its president. Its operations had for some years been on a large scale, but showed little or no profit. Under his management the company was put on a much better footing. He retired from it a few years later when the Federal Steel Company was formed, consisting of the Illinois Steel Company, the Minnesota Iron Company, the Lorain Steel Company and the Chicago, Lake Shore & Eastern Railroad Company.

On retiring from the Ilinois Steel Company he again assumed the management of the American Steel & Wire Company of Illinois, out of which grew, in 1898, the American Steel & Wire Company of New Jersey, of which he was made chairman. This was the company taken over by the United States Steel Corporation. It included, in addition to the wire properties originally consolidated, the Washburn & Moen Mfg. Company, the Cleveland Rolling Mill Company and the Shoenberger Steel Company. Its operations grew so large that it seemed necessary to have its own raw material and it acquired ore properties, built lake vessels and took other steps which made it entirely independent of steel companies from which some of its constituents had been buying billets. This was one of the complications leading to the strained relations which were the precursors of the United States Steel Corporation.

Mr. Gates, in the late '90s, conceived a plan for an international iron and steel trust. He went to Germany and laid before manufacturers there a proposal for an agreement which would have kept them out of the markets naturally tributary to the United States or to Great Britain. On the other hand, steel manufacturers in the two latter countries were not to attempt to take away from German steel manufacturers the markets they had held. The proposition, however, did not find favor in Germany.

While Mr. Gates was not active in the negotiations which resulted in the formation of the United States Steel Corporation, except so far as the American Steel & Wire Company was concerned, of which he was chairman, he had been an early advocate of what was commonly styled a "billion dollar consolidation" of the steel interests of the United States. Prominent as he was in the steel industry at that time, he was denied the honor of election as a director or an officer of the great corporation.

In 1901, the year the Steel Corporation was organized, Mr. Gates and his associates became active in the Colorado Fuel & Iron Company. They put a large amount of money into that corporation, but their connection lasted only about two years, when they sold their interests to others. In 1905 Mr. Gates, with Charles S. Guthrie, L. C. Hanna, E. J. Berwind and others, bought a controlling interest in the Republic Iron & Steel Company, which they proceeded to develop into a strong factor in the iron trade. Soon after they acquired control of the Tennessee Coal, Iron & Railroad Company, and so far as Southern operations were concerned the two companies were developed on lines mutually profitable. The relinquishment of control of the Tennessee Company to the United States Steel Corporation in 1907 is quite prominent in the public mind at present.

Mr. Gates took much interest in stock speculation from about the time he became connected with the Illinois Steel Company and his operations steadily grew in magnitude until, in the period from about 1898 to 1907, he was ranked among the leading operators in Wall Street. His coup in securing control of the Louisville & Nashville Railroad will long be remembered as one of the most audacious and successful operations ever carried out in Wall Street. In 1904 the stock brokerage house of C. G. Gates & Co. was established, in which the senior partner was the son of John W. Gates, and this house for several years was the largest speculative house in the street, largely through the operations of the latter.

The panic of 1907 apparently satisfied Mr. Gates that the time had come for him to retire from leadership in the stock market and he turned his attention to the development of oil and other properties in southern Texas, building up an important business center at Port Arthur. He established the Texas Company, which is an important competitor of the Standard Oil Company.

Mr. Gates leaves a widow and one son, Charles G. Gates.

Obituary

Ironton A. Kelly

Ironton A. Kelly, president of the Ashland Steel Company, Inc., Ashland, Ky., died in that city August 6, aged 62 years. He was born in Ironton, Ohio, and was educated in the public schools of that city. In 1884 he and others organized the Kelly Nail & Iron Company, of Ironton, of which he was vice-president and general manager until 1891. He then removed to Ashland, Ky., and with his associates organized the Ashland Steel Company, of which he was made president and general manager and had held this position continuously from its organization. The company operated a Bessemer steel plant and manufactured billets, sheet bars and wire rods. Mr. Kelly retained his interest in the Kelly Nail & Iron Company, of which he was vice-president and a director at the time of his death. He was also vice-president and director of the Merchants Bank & Trust Company, Ashland, which he and others organized in 1906. For some years he was a member and president of the City Council of Ironton, Ohio.

IRVING E. INGRAHAM, vice-president of the E. Ingraham Company, Bristol, Conn., died Aug. 2 at his home, Los Angeles, Cal., aged 52 years. He was the son of Edward Ingraham, who established the clock manufacturing business which bears his name. The son's younger life was passed in the factory, and he was the superintendent from 1890 until 1895, when he retired. He leaves a widow.

JOHN R. MITCHELL, president of the machine company bearing his name at Baltimore, Md., died Aug. 3 of pneumonia. Mr. Mitchell was the head of one of the oldest machine firms in the city. He learned his trade with Flynn, Emerich & Mitchell and later was with John Ives & Son.

COL. W. C. GREEN, for many years prominent in copper mining operations in the Southwest, died at Cananea, Mexico, August 6, of pneumonia, aged 58 years. His original venture in copper was at the old and practically abandoned La Cananea mines, purchased from the widow of Governor Pesquiera, of Sonora, Mexico. These he developed until they reached a productive capacity of 100,000,000 pounds of copper a year. He was forced in the panic of 1907 to give over the control of the Cananea properties, but he still retained large interests.

HENRY G. TROUT, president of the H. G. Trout Company, Buffalo, a pioneer in the manufacture of power boat propellers, died July 22, in Brooklyn, N. Y., where he was visiting while *en route* to Nova Scotia. He had suffered from penumonia during the past year.

The West Penn Steel Company, Brackenridge, Pa., has received a contract for 100 tons of pickled and cold rolled deep stamping sheet steel for export to England. The business was secured direct, after a sample lot had been submitted for tests.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, will soon commence the erection of four more 60-ton open-hearth furnaces at its plant at Monessen, Pa., which will give it a total of 12 60-ton furnaces. It is also understood that work on the building of two or more blast furnaces, plans for which have been under way for some time, will be started in the near future.

July Pig Iron Production

Slight Falling Off from the June Rate

Active Capacity August 1 the Same as on July 1

Our blast furnace statistics show that the production of coke and anthracite pig iron in July was 1,793,068 gross tons, against 1,787,566 tons in June. The daily rate in July was 57,841 tons as against 59,585 tons in June. The steel works companies in many cases banked their furnaces on July 3 and July 4, so that last month, with 31 days, only slightly exceeded the total for the 30 days of June. The great heat and humidity in July also had their effect upon production.

At the opening of August, 197 furnaces were in blast, with a daily capacity of 59,990 tons, as compared with 198 furnaces July 1, with a daily capacity of 59,979 tons. It thus appears that production is stationary. The merchant furnaces further reduced their output in July, their daily average production being 15,369 tons as against 16,877 tons in June. Steel works furnaces entered August with an active capacity somewhat greater than that of July. Two new stacks were blown in last month. One of these was Furnace D of the Central group of the American Steel & Wire Company, at Cleveland, Ohio, this being one of the largest and best equipped of the Steel Corporation's blast furnaces. The other was Furnace G of the Bethlehem Steel Company, which is of the same size as the large furnace this company blew in in March of this year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with July, 1910, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel works.	Merchant.	Total.
July, 1910	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,726	67,520
November	41,427	22,232	63,659
December	35,909	21,440	57,349
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585
July	42,472	15,369	57,841

Capacity in Blast August 1 and July 1

The following table shows the daily capacity of furnaces in blast, August 1 and July 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	August 1. Number in blast.	August 1. Capacity per day.	July 1. Number in blast.	July 1. Capacity per day.
New York:					
Buffalo	17	10	3,297	12	4,056
Other New York	7	3	585	3	495
New Jersey	7	0	0	1	183
Pennsylvania:					
Lehigh Valley	24	12	2,381	11	1,976
Spiegel	3	2	160	2	145
Schuylkill Valley	16	6	1,554	6	1,468
Low. Susquehanna	7	3	637	3	611
Lebanon Valley	10	5	616	5	780
Pittsburgh district	50	33	13,467	35	14,367
Spiegel	3	2	332	2	340
Shenango Valley	20	9	2,752	7	2,368
West. Penn.	27	11	3,025	7	2,520
Maryland	4	3	752	3	706
Wheeling district	14	9	3,135	9	3,120
Ohio:					
Mahoning Valley	24	17	6,660	17	6,615
Central and North	23	10	3,942	9	3,350
Hocking Val., Hanging Rock and S.W. Ohio.	15	2	230	3	407
Illinois and Indiana	32	21	8,742	20	8,480
Spiegel	2	1	60	2	255
Mich., Wis. and Minn.	10	4	744	4	752
Colo., Mo. and Wash.	7	3	1,050	4	1,117
The South:					
Virginia	22	6	665	6	650
Kentucky	5	1	156	2	245
Alabama	46	17	4,175	16	4,148
Tenn. and Georgia	20	8	873	8	825
Total	416	197	59,990	198	59,979

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,718	57,975	84,148	56,752
February	73,038	37,163	60,976	85,616	64,090
March	71,821	39,619	59,232	84,459	70,036
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,102	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,287	67,793	69,305	57,841
August	72,594	43,851	72,546	67,963	.....
September	72,783	47,300	79,507	68,476	.....
October	75,386	50,554	83,856	67,520	.....
November	60,937	51,595	84,917	63,659	.....
December	39,815	56,158	85,022	57,349	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago District Furnace Since January, 1907.

	1907.		1908.		1909.		1910.		1911.	
	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.
Jan.	26.00	25.00	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	15.05	16.15	16.30	17.80	14.25	15.00
Apr.	25.06	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	15.00
June	24.10	26.25	15.25	17.38	14.70	16.15	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	13.25	14.87
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	.....	.....
Sept.	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	.....	.....
Oct.	20.95	22.10	15.75	16.50	17.88	18.50	14.25	15.56	.....	.....
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	.....	.....
Dec.	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	.....	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907. Gross Tons.

	1907	1908	1909	1910	1911
Jan.	2,205,607	1,045,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,254	1,794,509
Mar.	2,226,457	1,228,204	1,832,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,295,505	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,575	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	1,793,068
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	.....
Sept.	2,183,487	1,418,998	2,385,206	2,056,275	.....
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	.....
Nov.	1,828,125	1,577,854	2,547,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production":

Production of Steel Companies—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1909	1910	1911	1910	1911
January	1,117,823	1,773,201	1,128,448	19,538	8,360
February	1,073,363	1,620,539	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,784
April	1,093,092	1,669,898	1,434,142	22,304	10,657
May	1,256,448	1,619,283	1,310,378	26,529	13,641
June	1,365,527	1,549,112	1,281,241	27,680	22,611
July	1,508,762	1,462,689	1,316,646	22,924	17,067
August	1,591,991	1,442,572	.....	25,756	.....
September	1,660,839	1,410,221	.....	15,151	.....
October	1,769,094	1,419,624	.....	8,500	.....
November	1,689,994	1,242,804	.....	9,032	.....
December	1,768,799	1,113,174	.....	12,178	.....

Output by Districts

The table below gives the production of all coke and anthracite furnaces in July and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York	157,624	139,674	130,927	130,395	124,347
New Jersey	5,869	5,510	9,788	3,600	1,386
Lehigh Valley	69,263	78,182	79,731	72,787	66,404
Schuylkill Valley	67,634	55,305	46,827	44,039	45,859
Lower Susquehanna and Lebanon Val.	46,980	44,537	44,179	41,751	40,084
Pittsburgh district	531,521	488,447	422,000	415,519	419,248
Shenango Valley	109,799	109,239	88,170	78,196	79,571
West. Penn.	120,464	100,593	61,892	60,047	73,177
Maryland, Virginia and Kentucky	61,628	60,978	53,271	48,969	52,583
Wheeling district	135,775	119,489	115,213	93,617	93,973
Mahoning Valley	203,006	189,822	187,748	188,187	184,402
Central and North. Ohio	170,914	161,742	152,909	141,973	116,953
Hocking Valley, Hanging Rock and S. W. Ohio	35,173	27,084	27,185	20,245	11,321
Mich., Minn., Mo., Wis., Col., Wash.	69,741	76,379	71,938	54,391	57,661
Chicago district	213,638	235,550	238,424	249,666	272,817
Alabama	143,751	149,737	134,386	117,015	126,200
Tenn., Georgia and Texas	28,331	22,178	28,868	27,169	27,082
Total	2,171,111	2,065,086	1,893,456	1,787,566	1,793,068

Among furnaces blown out in July were Lackawanna No. 1 and New York State Steel at Buffalo, Oxford in

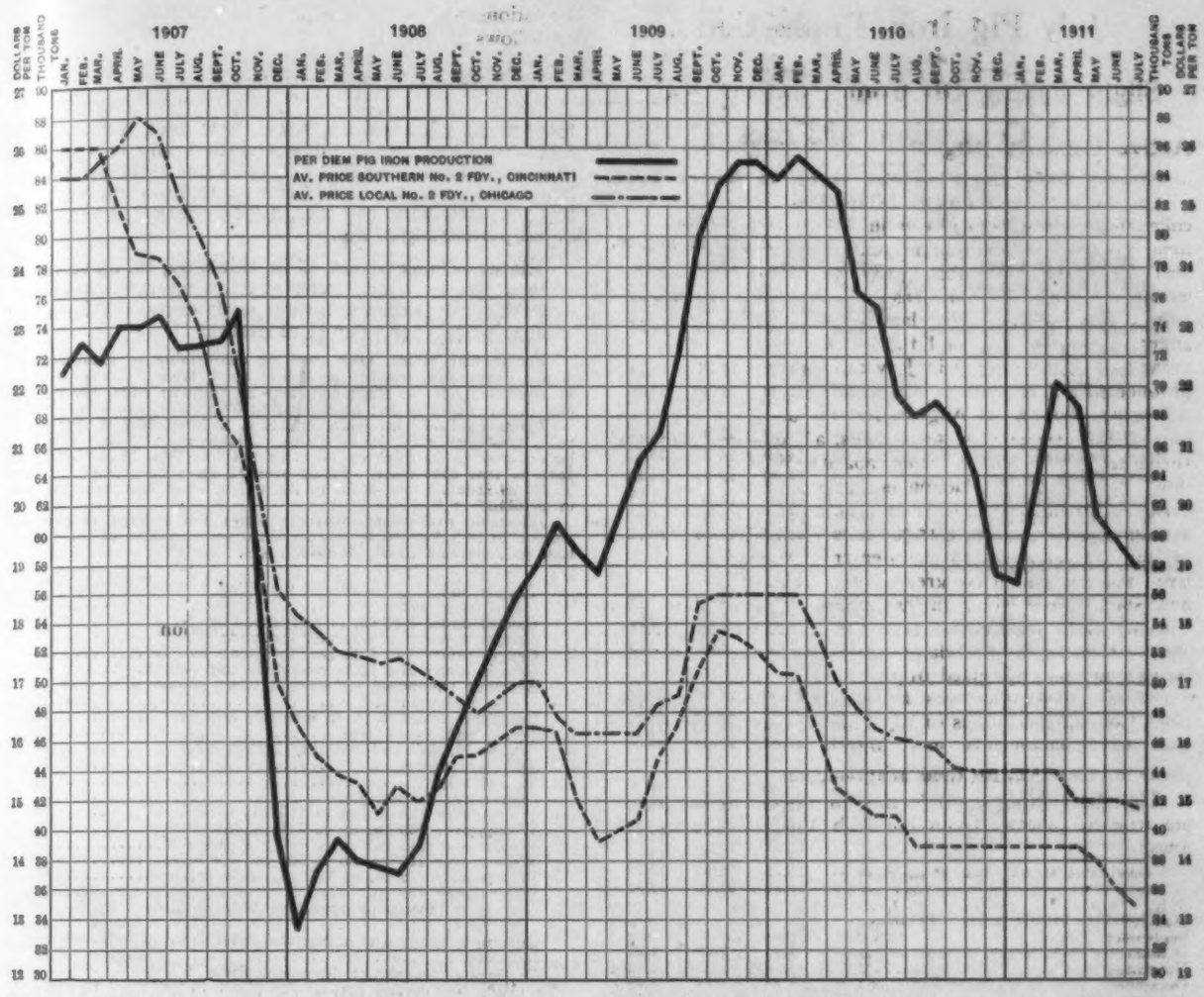

Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to August 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace.

New Jersey, Keystone in the Schuylkill Valley, Robesonia in the Lebanon Valley, one Schoenberger in the Pittsburgh District, Perry in Western Pennsylvania, West End and Radford Crane in Virginia, Ashland in Kentucky, Struthers and No. 2 Haselton in the Mahoning Valley, Lawrence in the Hanging Rock District, Missouri at St. Louis, the Detroit Iron & Steel Company's furnace in Michigan, and Alabama City in Alabama.

The list of furnaces blown in last month includes the new Bethlehem Furnace G in the Lehigh Valley, No. 2 Warwick in the Schuylkill Valley, No. 6 Duquesne in the Pittsburgh District, Atlantic and Hall in the Shenango Valley, No. 2 and No. 4 Cambria and Josephine in Western Pennsylvania, Alleghany in Virginia, No. 1 and No. 3 Ohio in the Mahoning Valley, one Columbus in Ohio, two Ensley in Alabama. The blowing in of the new Central Furnace D at Cleveland, Ohio is balanced by the blowing out of another furnace of the same group.

The Lake Superior Mining Institute

The sixteenth annual meeting of the Lake Superior Mining Institute will be held on the Menominee Range August 22 to 24. The meeting point is Crystal Falls, Mich., but mines in the Iron River and Dickinson County districts will also be visited. The programme as just announced by Secretary A. J. Yungbluth provides for the arrival and reception of visitors at Crystal Falls Tuesday forenoon, August 22. In the afternoon visits will be made to the Tobin, Bristol and Hollister mines, a new ore dryer being inspected at the last named. The Crystal Falls Commercial Club will entertain the institute at 6 p. m., and at 8 p. m. a business session will be held in the court house.

The members will leave Crystal Falls Wednesday morning in automobiles for the Iron River district, visiting Chicagoan Lake, Swanson, Baltic, Caspian, James, Davidson and other mines. Concrete shaft sinking will be seen at the Swanson. The Iron River Commercial Club will entertain the visitors at 6 p. m. and at 8 o'clock a session will be held at the Opera House with election of officers for the ensuing year. Thursday will be spent at Dickinson County mines the Loretto mine being reached at 9 a. m. Changes in the river's course and mining in the old river bed will be the features inspected. The hydroelectric plant at Sturgeon Falls will be seen on an automobile trip, also the electric equipment and concrete lined shaft at Vulcan. The visitors will be taken from Vulcan to Norway and Iron Mountain by automobiles, visiting the Chapin mine and inspecting the construction of a dam at Twin Falls. The list of papers prepared for the meeting includes the following:

"Accidents in the Transportation, Storage and Use of Explosives," by Charles S. Hurter, Duluth, Minn.
"Some Safety Devices of the Oliver Iron Mining Company," by Alexander M. Gow, Duluth, Minn.
"Tobin Mine Sub and Caving System," by Fred C. Roberts, Crystal Falls, Mich.
"Top Slicing and Caving System in the Stambaugh District," by W. A. MacEachron, Iron River, Mich.
"Square Set Mining," by Floyd L. Burr, Vulcan, Mich.
"Check System of Time Keeping," by James D. Vivian, Crystal Falls, Mich.
"Boiler Setting and Coal Handling," by J. E. Jacka, Crystal Falls, Mich.
"Electrical Operating Plants of the Penn Iron Mining Company," by Frank H. Armstrong, Vulcan, Mich.
"Socal Surroundings of the Mine Employee," by Charles E. Lawrence, Iron Mountain, Mich.
"A Diamond Drill Core Section of the Mesaba Rocks—No. IV.," by N. H. Winchell, Minneapolis, Minn.
"Block Caving on the Menominee Range," Author to be assigned.
"Surveying and Sampling Diamond Drill Holes," by Edwin E. White, Ishpeming, Mich.
"The Relation of Mining Interests to the Prevention of Forest Fires," by Thos. B. Wyman, secretary-forester, Munising, Mich.

Other papers are to be presented, including one on the "Time Keeping System at the Newport Mine" and a description of the "Salt Shaft at Detroit" by E. F. Bradt.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 9, 1911.	Aug. 2, 1911.	July 12, 1911.	Aug. 10, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	**13.50**	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	**10.25**	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	15.00	16.50
Basic, delivered, eastern Pa.	14.50	14.50	14.25	15.25
Basic, Valley furnace	13.00	13.00	13.25	14.25
Bessemer, Pittsburgh	15.90	15.90	15.90	16.15
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	*1.40*	1.45	1.40	1.60
Furnace coke, future delivery	**1.65**	1.60	1.55	1.80
Foundry coke, prompt shipment	1.85	1.85	1.80	2.15
Foundry coke, future delivery	**2.10**	2.00	2.05	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.50
Iron rails, Philadelphia	17.50	17.50	16.75	18.00
Car wheels, Chicago	12.75	12.75	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	12.75	14.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	14.25
Heavy steel scrap, Chicago	10.75	10.75	10.50	12.25
Heavy steel scrap, Philadelphia	13.50	13.50	13.00	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.42½
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.20	1.20	1.25	1.40
Steel bars, tidewater, New York	1.36	1.36	1.41	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.20
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galvanized, Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.00
Electrolytic Copper, New York	12.62½	12.62½	12.55	12.62½
Spelter, St. Louis	**5.80**	5.70	5.60	5.05
Spelter, New York	**6.00**	5.90	5.80	5.20
Lead, St. Louis	4.45	4.45	4.35	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	**43.00**	42.00	43.50	33.37
Antimony, Hallett, New York	*7.75*	8.00	8.12½	8.00
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 to 14, 1.60c.; Nos. 15 and 16, 1.70c., one pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld. Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
1 to 1¼ in.	..	..	49	43
⅜ in.	75	63	71	59
½ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
	Lap Weld.			
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	59
13 to 15 in.	51½	..	..	..

THE IRON AND METAL MARKETS

Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
⅜ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 9, 1911.—*(By Telephone.)*

Pig Iron.—The market is showing betterment in demand and prices are firmer. Some large lots of basic iron have recently been sold at low figures, but these sales have pretty well cleaned up the available supply and basic is now firmer at $13 to $13.25, Valley furnace; most sellers ask the higher figure and it is doubtful if any large lots of basic could be had under $13.25. Bessemer iron is still held under agreement at $15, Valley furnace, but dealers are selling small lots at $14.75 to $14.85. The large purchase of foundry iron by the Westinghouse Electric & Mfg. Company for this and next year's delivery has made prices on that grade somewhat firmer. There has also been some movement in forge iron. We note a sale of 2000 tons and another sale of 1000 to 1200 tons for forward delivery at $13, Valley furnace. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—There is not much new demand for steel, but specifications against contracts for billets and sheet and tin bars are coming in in excellent shape. We note several small sales of forging billets at the full price of $26, Pittsburgh, for base sizes and carbons. We quote Bessemer and open-hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $12, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Structural Material.—The McClintic-Marshall Construction Company, Pittsburgh, has received an order for 1750 tons of steel for new paper mill buildings for the Lake Superior Power Company at Saulte Ste. Marie, Ont.

Steel Rails.—The Carnegie Steel Company has sold 1750 tons of standard sections for prompt delivery to the Baltimore & Ohio Railroad.

(By Mail.)

Excellent reports on the present condition of the iron trade are being given out this week by the heads of sales departments of several of the larger steel interests, and there seems to be no doubt that conditions are somewhat better, with the outlook for remainder of the year very hopeful. The pig iron trade is showing improvement. The Westinghouse Electric & Mfg. Company bought 12,500 tons of Northern foundry iron, about half of it for delivery in the last quarter of this year at its Allegheny and Cleveland works, and the other half for delivery in the first quarter of next year in equal amounts at the same plants. A Valley furnace operator sold in the early part of last week 10,000 tons of basic iron to a malleable casting concern in the Shenango Valley at $13, delivered; there being a freight rate of 40c., the iron netted the seller $12.60 at furnace. This sale of basic and the recent trade of 60,000 tons of basic which was made by the Struthers Furnace Company to the Republic Iron & Steel Company for ore have pretty well cleaned up the basic market and prices are firmer. It is doubtful if any basic could be had to-day in large quantities under $13, and most sellers ask $13.25 at furnace. Bessemer iron remains nominally at $15 at furnace, but the few sales being made, mostly by dealers, are at $14.75 to $14.85 at furnace. Prices on billets and sheet bars are being well maintained, the largest inquiry in the market being that of the Kokomo Steel & Wire Company, Kokomo, Ind., for 30,000 to 40,000 tons of rod billets, which will likely go to a Youngstown mill. The coke and scrap trades, which have been dragging for some time, are showing some betterment in new demand and prices.

Ferromanganese.—Consumers are pretty well covered on their requirements over the remainder of this year, but owing to the low prices ruling are interested in the market for next year delivery, and a number of inquiries are out for 1912 shipment, several of these being for 500 tons each. Importers are not disposed to sell into next year at present prices of $37, Baltimore, but are asking premiums of $1 to $2 a ton over the present price. Some concerns are refusing to quote on such business, preferring to wait until later in the year. It is not believed that much ferromanganese can be bought to-day for 1912 shipment at $37, Baltimore, but this price is still ruling for delivery over the remainder of this year, the freight rate to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Prices continue very strong, having advanced $2 a ton in the past two or three weeks. The demand is quiet, as consumers are covered for remainder of this year, but some inquiry is out for 1912 delivery. We quote 50 per cent. ferrosilicon at $53 to $54, Pittsburgh, most sellers asking the higher figure. We quote blast furnace ferrosilicon as follows: 10 per cent., $23; 11 per cent, $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—No recent sales have been made, but prices are firmer and one seller is refusing to sell at less than $29. We quote best grades of muck bar, made from all pig iron, at $28.50 to $29, delivered in the Pittsburgh district.

Skelp.—A sale of 1000 tons of wide sheared iron plates for September and October delivery is reported on the basis of 1.70c., delivered at buyer's mill, Pittsburgh. The new demand is quiet, most consumers being covered for some time ahead. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron

THE IRON AND METAL MARKETS

skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The new demand for wire rods is quiet, most consumers being covered, but makers report that specifications on contracts have been coming in a little more freely in the past three or four weeks. The new Morgan continuous rod mill of the Jones & Laughlin Steel Company at Aliquippa, Pa., has not been completed, as reported in the daily press, and will probably not be ready for operation before October. This will give the company two Morgan rod mills at Aliquippa with a combined daily capacity of about 700 tons, and it is adding some new finishing mills to take care of the increased rod output. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh.

Steel Rails.—In the past week the Carnegie Steel Company took several fair-sized orders for standard sections for export and some scattering small lots for export. It also booked new orders and received specifications against contracts for about 3000 tons of light rails. A good part of the business in standard section rails that have been rolled by the Edgar Thomson rail mills for some time has been for export. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—As yet none of the large inquiries for steel cars noted in this report last week has developed into actual orders, but it is believed that this will occur in the near future, as it is known positively that a number of the Western roads are badly in need of equipment to move the crops. The Atlantic Coast Line has placed a contract with the Standard Steel Car Company for 900 box cars and 100 flat cars. The leading plate mills in the Pittsburgh district are now operating to about 75 per cent. of capacity, which is a heavier rate of operation than for some time. We continue to quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on specially desirable orders on both narrow and wide sizes.

Structural Steel.—The McClintic-Marshall Construction Company has taken about 3000 tons of bridge work for several Western roads and the American Bridge Company has taken some very large contracts in the East, one involving some 16,000 tons. Local work coming up includes the new Harris Theater on Diamond street, about 1000 tons, and the Point bridge, 5000 to 7000 tons, both of which will likely be placed this month. Inquiries are reported as heavier, and some of the structural concerns state they are getting slightly better prices on fabricated work. We continue to quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

Sheets.—The new demand for black, galvanized and roofing sheets continues quite heavy, and the mills are receiving specifications against contracts very freely. As a result shipments by the mills are heavier now than at any time for some months and operations are also on a larger scale. The American Sheet & Tin Plate Company is operating this week close to 70 per cent. of its hot sheet mill capacity, while the independent mills are running at the same rate or slightly heavier. Prices are fairly well maintained, but on galvanized sheets are being shaded in some cases and in certain sections about $1 a ton. The full schedule of regular prices is printed on a previous page.

Tin Plate.—Present conditions in the tin plate trade are quite satisfactory, the new demand being as large as expected at this season, while specifications against contracts from the can makers are coming in quite freely. The American Sheet & Tin Plate Company has started up additional tin mills and this week is operating very close to 80 per cent. of capacity, the independent tin plate mills running at about the same rate. Prices are being firmly held.

Bars.—The leading makers of steel bars have quite a heavy tonnage on their books for forward delivery and as a result prices are slightly firmer, one leading mill stating that it is holding firmly for 1.25c. at mill on new orders. We quote steel bars at 1.20c. to 1.25c., Pittsburgh, the lower price being named only by one or two mills on very desirable orders. Common iron bars are quiet and are held at 1.25c. to 1.30c., Pittsburgh.

Hoops and Bands.—New orders for hoops and bands have been much better in the past three or four weeks, and specifications against contracts are also coming in more freely. Shipments by the mills against new orders and contracts are heavier than for some time. We quote steel hoops at 1.40c. and bands at 1.35c., extras on the latter as per the steel bar card.

Merchant Steel.—New orders are coming in more freely and specifications against contracts so far this month have been heavier than in the same period in July. Prices are reported as slightly firmer. Regular prices, which are more or less shaded, are as follows: Iron finished tire, ½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Current new business and specifications are heavier than for some time, and the condition of the rivet trade is referred to as more satisfactory than for some months. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—There is a moderate amount of new buying in wire and wire nails, but jobbers and retailers are still inclining their orders to small lots to cover actual needs, there being no desire on the part of the trade to contract ahead. Prices are being better maintained than for some time, but in some cases wire nails and wire are still being shaded $1 a ton. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full freight added to point of delivery.

Spelter.—The market continues very firm and a scarcity is reported in the supply of spelter for prompt shipment. We quote prime grade of Western at 5.80c. East St. Louis, equal to 5.92½c., Pittsburgh. We note that some sellers are asking 5.85c., East St. Louis, and refuse to shade this price.

Merchant Pipe.—An inquiry is in the market from Chicago for 30 miles of 6 to 8-in. pipe for a gas line. Leading mills report that the new demand for merchant pipe is heavier than usual at this season and shipments by the mills in July were a little larger than in June. It is stated that prices are being fairly well maintained. Regular discounts on iron and steel pipe are given on a previous page.

Boiler Tubes.—There has been no improvement in any way in the market on boiler tubes, which has been very unsatisfactory for some months. The railroads are not specifying freely against contracts and current new demand is light. Discounts continue to be more or less shaded.

Coke.—General conditions in the coke trade are referred to as being slightly better, the supply of blast furnace coke for prompt shipment having been cut down materially in the last month or two and slightly better prices are being maintained. A local concern reports a sale of 100 cars of standard grade furnace coke for prompt shipment for which it secured $1.50 per net ton at oven. The General Electric Company has recently placed some fairly large contracts for foundry coke, deliveries running over the next six months. No large inquiries are in the market for furnace coke, as most consumers are covered. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.60 to $1.65 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.90 to $2 and on contract from $2.10 up to $2.25 per net ton at oven. One local concern reports that it recently secured contracts for 72-hr. foundry coke for delivery over the next six months at $2.40 per net ton at oven. The coke made by this concern has a very high reputation in the trade and always commands the highest prices ruling. The output in the Upper and Lower Connellsville regions last week was 284,297 tons, an increase over the previous week of about 2400 tons.

Iron and Steel Scrap.—Conditions in the scrap trade are better, the demand for steel scrap being heavier, and dealers report they are able to obtain slightly better prices. Bids closed Tuesday on about 15,000 tons of old material held by the Pennsylvania Railroad, of which about 5000 tons is heavy steel scrap. Other railroads have sent out their monthly scrap lists, and bids made by dealers on these lists are in nearly all cases slightly higher than last month. Heavy steel

THE IRON AND METAL MARKETS

scrap is now firm at $13.25 for delivery in the Pittsburgh and nearby districts, and for forward delivery $13.50 is asked. We have advanced prices on some grades of scrap and now quote as follows:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.50 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.25 to 15.50
Cast iron borings	9.00 to 9.25
*Machine shop turnings	9.50 to 9.75
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., August 9, 1911.—*(By Telegraph.)*

While it may be noted with satisfaction that manufacturing capacity in this district and elsewhere is apparently mounting slowly to higher percentages of activity it is also possible to discern disappointment because of the very small proportions of bookings for future delivery. Current business, with the possible exception of steel bars, is essentially of the hand-to-mouth variety, and orders which cannot be entirely filled within 30 days are the exception. Whatever may be the reason buyers apparently are not satisfied with the present situation or with present prices as a basis for buying freely to cover their future needs. In this respect Southern pig iron is slightly improved, but sheet and plate mills do not find their bookings amenable to a very satisfactory rolling schedule, hence the prevalence of price shading where desirable filling-in orders are available. Prompt shipment orders for structural shapes are among the most prominent factors in the improvement, but expectations beyond the immediate future are based on general conditions rather than contracts. The narrow limits beyond which current business seems impossible of extension constitute the principal weakness of the situation. It is possible that the great increases in manufacturing capacity which now permit the filling of orders much more rapidly will cause a readjustment of opinion as to what status of the mill order books constitutes good business.

Pig Iron.—Sales of high phosphorus iron to stove manufacturers have been a feature of interest in the market of the past week in which Southern furnaces and a Wisconsin interest have participated. The inquiry for malleable iron continues active, and it is understood that the northern Indiana car builder's requirement of 10,000 tons remains unsatisfied. The reason for this is perhaps typical of the market situation, in that furnaces apparently are unwilling to concede the present prices for extended delivery such as would be involved in the sale of such a tonnage, while the buyer presumes that the desirable character of his business should bring out this concession. Standard Birmingham iron is selling at $10.25, Birmingham, for prompt shipment, with some sales at $10.50 for the fourth quarter. Numerous inquiries are being received for first quarter and first half shipment, but furnaces generally are not quoting for this delivery. Northern iron is still considerably weaker than Southern, and prices are unchanged on the basis of $14.50 f.o.b. local furnace, although some orders are being taken at $15, delivered. An inquiry for 10,000 tons of basic is reported from St. Louis. One of the Mayville furnaces was blown in last week. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke, No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent.	17.90
Jackson Co. and Kentucky silvery, 8 per cent.	18.90
Jackson Co. and Kentucky silvery, 10 per cent.	19.90

(By Mail.)

Rails and Track Supplies.—Sales of rails during the past week as reported by local mills were of very moderate tonnage. Specifications for track fastenings continue about normal. At Gary the rail mill is running on a slightly heavier schedule this week. Light rail business fails to show promise of any marked activity. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The largest item of the week among the 14 awards of structural contracts reported was 1200 tons for track elevation for the Chicago & Western Indiana. The Mt. Vernon Bridge Company will fabricate this steel. Several viaducts to be built at East St. Louis will require 819 tons to be furnished by the American Bridge Company. The balance of the contracts placed were small, aggregating about 1850 tons. They included molasses storage tanks for the Amalgamated Sugar Company, Ogden, Utah; two bridges for the Ottawa & Peoria Railway Company; repairs for the Twelfth Street viaduct, Chicago, for the Chicago, Rock Island & Pacific; a building for the Northwestern Iron Company, Mayville, Wis.; Sharples Building, Chicago; a sub-station for the Commonwealth Edison Company, Chicago; Lowry Boiler Works, St. Paul, Minn.; post office and court house, Sioux Falls, S. D.; school building, Gary, Ind.; power station for the Suburban Light & Power Company, Oak Park; a store building for H. F. Schaller, Watertown, S. D., and three steel-faced dams for the Boston-Colorado Power Company, Denver. The run of mill tonnage in structural material continues heavy. Prices are quite firm and are well maintained on the basis of 1.35c., Pittsburgh. The large number of inquiries for cars now in the market is an encouraging feature of the structural situation. We continue to quote plain material for mill shipment at 1.53c. and for shipment from store 1.75c., Chicago.

Plates.—Plate tonnage shares with structural material an encouraging degree of activity. With the hoped for placing of orders for several thousand cars to supplement the sustained specifications against bridge contracts, mill bookings of plates are expected to continue very satisfactory. In view of these conditions the prices of plates are not being subjected to much pressure and we quote, for Chicago delivery, mill shipment 1.53c. and from jobbers' stock 1.75c.

Sheets.—While the local sheet mills are running in all departments and it is reported that instructions have been issued urging the rapid placing in operation of the new American Sheet & Tin Plate Company's mills at Gary, makers of this product are far from satisfied with the orders received. Buying apparently is absolutely restricted to current needs, and mills are not only forced to roll a wide variety of sizes in small quantities, but also lack future business. Users of sheets do not seem disposed to contract ahead. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c. to 3.55c.

Bars.—One steel bar interest reports that sufficient tonnage has been placed on the books to provide, together with such incidental business as may be received from time to time, practically enough tonnage to carry it into midsummer of next year. There still remains, however, a considerable steel bar tonnage to be placed. For routine business the price of 1.25c., Pittsburgh, seems to be well maintained but for an attractive order this price could doubtless be shaded. There does not seem to be much improvement in the demand for bar iron but the mills apparently are considerably less willing to accept business at a loss and indications point to the price of 1.20c. as a minimum. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

THE IRON AND METAL MARKETS

Wire Products.—Reassuring reports regarding crop prospects have had a beneficial effect on the barb wire trade and manufacturers using fence wire are preparing more liberally for fall business. Improvement is also noted in the movement of wire nails, although some shading of prices is reported. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—No very considerable tonnage of pipe was purchased the past week, but it is expected that 3600 tons will be awarded at Portland, Ore., at once. A sale of 1400 tons of 24-in. to the Union Stock Yards Company, Omaha, is noted. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—Although no change of moment is apparent in the market for old material, the upward trend of business in finished steel products has shown its influence. Shipments from Chicago to Eastern markets, particularly of borings, have caused a slight advance here. Steel scrap is also firmer and shows a tendency to move at higher prices. The railroad scrap offerings of the week include 11,500 tons by the Baltimore & Ohio, in which are 3000 tons of rails, 1000 tons of car wheels, and 1500 tons of No. 1 wrought. The Great Northern is offering 10,000 tons, of which the principal items are 1800 tons of rails, 800 tons of malleable scrap, and 1500 tons of Nos. 1 and 2 wrought. The Chicago, Milwaukee & St. Paul offers 1500 tons; the Soo Line 600 tons, and the Chicago & Eastern Illinois 800 tons. We quote below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.25 to 11.75
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	10.75 to 11.25
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., August 8, 1911.

While a little hesitancy is observed in the buying of certain classes of finished products, due in a measure to reports of possible price concessions, the general volume of business continues fairly good and in some branches shows a slight gain over the previous week. As far as lower prices are concerned most reports appear to be without fact or at least cannot be definitely traced. Rumors that concessions have been made on plates are denied in this district. Steel bars, however, can be done under the recent 1.25c., Pittsburgh, base. The pig iron movement continues active, with fairly good sales of foundry, forge and steel making grades. A more active demand for freight cars is reported, inquiries for an aggregate of 12,000 to 14,000 being in the market. The situation in refined iron bars is unchanged. The coke market is not very active, but low prices for prompt shipments are less in evidence.

Iron Ore.—Very little interest is being shown in the ore market. Arrivals of foreign ore at this port last week were somewhat larger, including 12,650 tons from Cuba, 5603 tons from Spain, 4443 tons from Africa, 12,600 tons from Newfoundland, 4130 tons from Sweden, 4550 tons from New Brunswick and 183 tons from England.

Pig Iron.—Sales have not been large individually, but a comparatively good aggregate tonnage in various grades has been sold. Sellers report July business as having been very satisfactory under prevailing conditions and furnaces are as a rule so well booked ahead that they are not only showing less disposition to sell, except to take care of customers' regular requirements, but have in several instances practically withdrawn the recent quotation of $15, delivered, for standard analysis No. 2 X foundry. Good brands of this grade are still available, however, at that figure, although several sellers are quoting $15.25, delivered, as a minimum. A more pronounced inquiry for foundry iron is reported. In the higher grades the greatest demand has been for small and moderate lots, running up to 500 tons; several 1000-ton lots, however, are under negotiation. Inquiries have come out for deliveries extending beyond the year end, but sellers still refuse to make definite quotations for shipment so far ahead. Cast iron pipe makers are showing more interest in the market. Practically all the Delaware River pipe foundries are making inquiries for low grade iron, which appears to be rather scarce. One interest has an inquiry out for 5000 tons, half No. 3 foundry and half foundry forge, for October-November shipment. Two other interests would probably take 10,000 tons each, but find that sellers will not meet their views as to prices. A heavier movement in Virginia foundry grades is reported; sales have been largely in moderate lots at unchanged prices, although one of 2000 tons for shipment into this district and one of 1250 tons for Western delivery are reported. Virginia producers have reduced stocks in the past month. The leading producer, which has been running two stacks, now reports but one furnace active. Forge iron has been more active, with one sale of several thousand tons at $14.25, delivered in this district. More interest has developed in the steel making grades; one melter is out with an inquiry for about 25,000 tons of basic for the first quarter of 1912, but sellers have not decided on quotations for deliveries so far ahead. A sale of 6000 tons of Virginia basic to New England, for delivery over the next six months, is reported, at about $12.75 furnace. A lot of several thousand tons of eastern Pennsylvania basic for early delivery was also sold to a nearby consumer at a price equal to $14.50 here. Low phosphorus iron has been taken in moderate lots, for early shipment, at prices around $20 to $20.50, delivered here. The general range of pig iron prices in this district shows no actual change, but concessions have disappeared and sellers are frequently obtaining the outside range of quotations for some grades. Sellers' position is gradually becoming stronger; production probably decreased in July, and stocks, particularly on eastern Pennsylvania furnace banks, will show a further sharp decline. The condition of furnace order books is improving, and a strong undercurrent favoring advances in prices is noted. The following range is reported for standard brands, delivered in buyers' yards, in this immediate district, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferromanganese.—While there has been little fresh inquiry from consumers in this district, the report of a quiet sale of 500 tons to an Eastern consumer at $36.50 just prior to the general advance to $37, Baltimore, has come out. Sellers are now firmly holding the $37 price.

Billets.—Current business has been smaller, sales as a rule being under rather than above 100-ton lots. One inquiry for 5000 tons is reported, but is being looked upon as more for the purpose of testing the market than a bona fide inquiry. Makers are not showing any gains in the productive rate, but continue to maintain firmly the $23.40 basis for rolling billets and $28.40 for ordinary forging billets, delivered in this vicinity.

Plates.—There has been a better run of both small orders and specifications and some of the mills show a slight gain in production over the previous week and look for a higher rate this week. Eastern makers, however, have not yet reached the rate of activity noted late in June. Few sales larger than 300 to 400 tons are reported, although inquiries for several round lots, including one of 1500 and another of 700 tons of ship plates, are to be noted. Negotiations are pending for several thousand tons of plates for pipe. Notwithstanding rumors of lower prices, makers in this terri-

THE IRON AND METAL MARKETS

tory contend that the recent 1.50c. quotation for ordinary plates, delivered here, has not been shaded.

Structural Material.—Sales so far this month have not been particularly active. No large contracts have been reported during the week, although negotiations are pending for several buildings and more work of that character is in prospect. Inquiries are out for 1500 tons of shapes for ship work. While the price of plain material is maintained at 1.50c., delivered here, quotations for fabricated material are still reported to be irregular.

Sheets.—The irregularity in prices in the West does not seem to have interfered materially with Eastern mills. In the majority of cases producers in this district have been more actively engaged, in instances operating at full capacity. The bulk of the orders coming in have been small and for urgent delivery, but aggregate a very fair total. Business promises to continue at a good basis and sufficient orders are on hand to keep plants running full this week. Eastern makers' prices are unchanged, the following range f.o.b. mill being named: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—The proposed advance in prices of refined iron bars does not appear to have been deemed advisable; at any rate the old basis of 1.20c. at mill can still be freely done for good specifications, while 1.22½c. stands for small miscellaneous business. As the buying has been rather indifferent recently, there is some doubt expressed as to the firmness with which sellers will hold the above named figures, which are equal to 1.27½c. to 1.32½c. delivered here. Steel bars are available at 1.35c. to 1.40c. delivered in this vicinity.

Coke.—Spot furnace coke is not in as good supply and prices have stiffened a trifle. For prompt shipment this grade now commands $1.50 to $1.60 at oven. Prices for forward furnace coke range from $1.55 to $1.75 at oven, with few sales reported. There is a moderate movement in foundry coke, both for early and forward delivery. Sales, however, have not been large individually and prices show no particular change. The following range of prices is named, per net ton, for delivery in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.15 to 3.35
Foundry coke	3.75 to 4.20

Old Material.—The market has a waiting appearance. Bids are going in against the monthly railroad lists which close between the 10th and 15th, and in a number of instances higher prices than those of last month are being offered. Bidders in the majority of cases are naming over $13.50 for heavy melting railroad steel. Few sales have been reported in any of the usually active grades. Small lots of steel have been sold at recent quotations, but sellers are inclined to hold for a higher level. Rolling mill scrap, while not active, is decidedly strong. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.50 to $13.75
No. 1 yard heavy melting steel scrap	13.00 to 13.25
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, August 8, 1911.

Iron Ore.—Sales in the past week have been inconsiderable, the aggregate being small. Furnacemen are not coming into the market in the manner expected. July shipments from Lake Superior ports exceeded those of June by 394,868 tons, but it is expected by Cleveland shippers that August will show a decrease as compared with July. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Coke.—Demand has fallen to a minimum in furnace coke, and there is little improvement in the inquiry from foundries. We quote standard Connellsville furnace coke at $1.40 to $1.50 per net ton at oven, for spot shipment, and $1.65 to $1.75 for the remainder of the year. Connellsville 72-hr. foundry coke is quoted at $1.80 to $2.15 at oven for prompt shipment and $2.15 to $2.40 for the remainder of the year.

Pig Iron.—The most important sale in several months in which Cleveland-made pig iron was involved was that to the Westinghouse Electric & Mfg. Company closed several days ago. The bulk of the iron, it is understood, went to a Cleveland maker for both the company's plants at Pittsburgh and in this city. The price is said to have been on the basis of $13.50 for No. 2 Valley, for last half delivery, and $13.75, Valley, for first quarter. However, the furnace company which is generally credited with taking the larger part of the tonnage declared to-day that it did not bid on the next year delivery, refusing absolutely to commit itself on such business with the present uncertainties of the coke market confronting it. It is known also that another bidder on the same business, who offered next year delivery at an advance of 50 cents and more over the present Valley price, did not get the award. The sale is regarded here as important, in that, while it involved Nos. 1, 2 and 3 grades in the total tonnage of 12,500 tons, of which 6000 tons were for the Cleveland plant, it settles more definitely the Valley price for No. 2, which has been more or less problematic for several weeks. Cleveland makers of pig iron all say that a fair tonnage of iron is being daily shipped from their yards, the aggregate being very satisfactory. Foundries are steadily taking iron, apparently for daily consumption, but no large tonnage is going to any one consumer. The feeling among Cleveland furnace owners is better to-day than in months and the general optimism expressed appears to have real foundation in fact. For Cleveland delivery we quote as follows for prompt shipment and for last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	14.00 to 14.25
Gray forge	13.25
Southern foundry No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent silicon	17.50 to 17.75

Finished Iron and Steel.—Mill specifications are slowly but steadily increasing, but new business is rather slow in coming out. At the moment the only large tonnage in prospect is that for the city hall, but it is generally understood that little will be done about it for some weeks. Considerable new building is being done throughout the city, but the amount of steel used in any one structure is small. The steel bar market, which appeared to have developed a tendency toward weakness in northern Ohio last week, has been given somewhat more of a peg upon which to hang. A tonnage of steel bars, about 800 tons, was let at Toledo a few days ago, the business going to a leading maker at its bid of 1.20c., Pittsburgh, this being one of two bids at that figure. It develops that the bars are to be used by the American Can Company for new construction. There had been some talk that at least one reroller had bid 1.15c. and there was a rumor of even a lower price. But the actual closing at 1.20c. has helped the market, although the general quotation in this city is 1.25c., Pittsburgh, by most makers. Local rolling mills are preparing for more activity this fall. The Empire mill resumed operating last week, the Union is planning to go on in about two weeks and the Lake Erie is also actively preparing to start. We quote iron bars at 1.25c. to 1.30c. at mill.

Old Material.—More buying activity is noted in various grades of material. Up to this time buying locally had been confined largely to heavy steel and turnings, the latter for shipment to Pittsburgh. Now the local mills are inquiring for busheling as well, and in fair quantities, all of which has given the local market a brighter aspect. Some mills are bidding for material in shop alongside dealers. Outside mills, but located in the Cleveland district, are also becoming more active bidders in this city, especially for heavy steel, one offer being $12.50, f.o.b. Cleveland. A sale last Saturday in this locality of 1300 tons of old steel rails brought out some interesting prices. The larger part of the tonnage went to a dealer at $14, while a smaller portion went at a shade under this price. This is an advance of $1.50 a ton over the last previous sale of this material here.

THE IRON AND METAL MARKETS

Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.50 to $14.00
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.00 to 12.50
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.75 to 7.00
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.00 to 8.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, August 9, 1911.—*(By Telegraph.)*

Pig Iron.—Southern prices are firmer and, while it is probable that a few brands of No. 2 foundry can be obtained around $10 for prompt shipment, the majority of furnaces are asking $10.50, Birmingham, for any delivery this year, although a few sales for last quarter shipments have been made at $10.25 at furnace. Considerable speculative iron is being quietly bought by purchasers who generally keep in close touch with inside conditions, and, as the bulk of Southern iron is now held by producers who are not compelled to sell for financial reasons, it is quite likely that the present price advance will stick. Conditions in the Hanging Rock district show no change and No. 2 foundry is freely quoted at $13, Ironton, with malleable around $13 to $13.25. One large inquiry for malleable is out that is expected to be closed shortly. A few lots of Southern charcoal iron are being contracted for between $22 and $22.50 at furnace. Recent sales of Southern No. 2 foundry include 300 and 1000 tons to local foundries for this year's shipment. A few nearby melters have also filled up for the remainder of the year. Among inquiries out are one from central Ohio for 1500 tons of Southern foundry iron, and another from a nearby consumer for 1000 tons of Southern and 500 tons of Northern No. 2 foundry. No quotations are being made for next year's delivery, and it is stated that the furnace interests generally are emphatic in declaring that iron contracted for this year must be moved before January 1. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00
Southern coke, No 2 foundry and 2 soft	13.50
Southern coke, No. 3 foundry	13.00
Southern coke, No. 4 foundry	12.75
Southern gray forge	12.75
Ohio silvery, 8 per cent. silicon	$16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—One large producer in the Wise County field has advanced the price of 72-hr. coke to $2.25 per net ton at oven for either prompt or deferred shipment, and this has had a tendency to harden prices in that particular district, although some high grade foundry coke is obtainable there as low as $2, with deliveries running through the next six months. Contracting in both foundry and furnace grades is very light, and as consumers have nearly all covered for future requirements no change is anticipated in the demand for some time. Furnace coke in all three fields is rather irregular and is quotable all the way from $1.40 to $1.70 for any shipment wanted. Foundry coke also shows a wider range and it is quite probable that $1.90 to $2 per net ton at oven in all three fields could be done on the lower grades for movement this year, with some of the best known brands bringing as high as $2.35.

Finished Material.—Structural material is moving fairly well and prospects are brighter. So far as mill prices on steel bars are concerned nothing below 1.25c., Pittsburgh basis, is being done here, and at this figure a few medium-sized orders have lately been placed, among them being one for about 500 tons of reinforcing concrete bars for a public job. Sheets are dragging and mills in other territory are reported to be making recessions in the regular market prices, but manufacturers in this vicinity are holding firm, and due to the late advance in spelter they are indifferent about taking orders for galvanized sheets below present quotations. Hoops are stationary at 1.40c., mill, with a slackening up of both the inquiry and actual business booked. The local warehouse price on steel bars is 1.70c. and on structural material 1.80c.

Old Material.—The Baltimore & Ohio and Norfolk & Western railroads, as well as the Big Four, have issued some large lists of scrap. The firmer attitude that has been taken by Southern pig iron producers has appeared to stimulate interest in the scrap market, but sales continue to be limited to small quantities for immediate requirements and long time contracts are said to be scarce. The approximate prices paid by buyers for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting steel scrap, gross ton	10.00 to 10.50

Birmingham

BIRMINGHAM, ALA., August 7, 1911.

Pig Iron.—The sentiment in this market continues to improve, but recent additions to order books are comparatively small. Of sales reported for the past week a lot of 400 tons of No. 2 soft for shipment in the third quarter was the largest. This iron was sold at $10.50, Birmingham, and an aggregate of 850 tons, consisting of carloads and lots of 100 to 150 tons, is reported as bringing the same price. For small lots it is claimed that $10.50 for No. 2, with a differential of 50 cents for No. 3 foundry and 25 cents for lower grades is generally ruling as applicable to shipments within 60 to 90 days. For delivery further advanced quotations range above $10.50 for No. 2 foundry, with the limit for all deliveries placed at January 1. In view of the volume of inquiry now pending for 1912, developments in the matter of price for advanced requirements are expected at an early date. As is indicated by the demand for spot shipments and the rate at which old contracts are being taken out, the trade generally is not provided for the farther future to the extent at one time credited. Stock reports of August 1 show a reduction of 22,000 tons in July in the aggregate accumulation, the reduction consisting of 16,000 tons foundry iron and 6,000 tons basic. On August 1 only 17 stacks were being operated in this State, of which four were producing basic iron. We quote prompt shipments or deliveries within the third quarter as below, f.o.b. cars Birmingham furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Off basic	$10.00 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Old Material.—This market was very quiet during the past week and without any developments that would indicate the correct level of prices. The transactions recorded involved carlots principally, with the consuming interests disposed to consider bargains only. No attempt is made to revise quotations, but we quote the market as steady with the following prices generally asked by dealers. These are per gross ton f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Cast Iron Pipe.—The successful bidder on the round tonnage of water pipe required for the city of Portland, Ore., and which was to have been awarded August 1, is not known at this time. Awards to local concerns during the past week consisted of comparatively small

THE IRON AND METAL MARKETS

lots, but the aggregate tonnage is fair. No large contracts for early letting have been added to those mentioned last week, and considerable tonnage is still awaiting necessary financial arrangements. Quotations of local sellers have been advanced and the condition of order books when compared with the present rate of production are such that the revised prices will no doubt be maintained. This depends very largely on developments in the pig iron market and the extent to which new business now in contemplation materializes. We quote revised quotations on water pipe as follows per net ton f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Announcement is made that the Alice furnace of the Tennessee Coal, Iron & Railroad Company will be blown in August 18.

The finishing department of the Southern Iron & Steel Company's plant at Alabama City, Ala., is now being operated to some extent, but no announcement is made relative to the starting up of the open hearth furnaces.

Operations have been resumed at the car works of the Alabama Great Southern Railroad at Gadsden, Ala., after having been suspended for six weeks.

Buffalo

BUFFALO, N. Y., August 8, 1911.

Pig Iron.—Both inquiry and sales have been of smaller volume for this district in the week just past than for the preceding week. Business placed has been principally in carload lots and for foundry grades, although some moderate sized tonnages have been sold for canal shipment to New York.

A moderate business has also been done in charcoal iron, including one order of fairly good tonnage for shipment during the third quarter. Consumers as a rule are hurrying shipments on contracts, indicating that foundries generally are doing a good business and that further buying of pig iron will soon be in order, when buyers become satisfied that the firmer prices at which producers are holding iron are to be maintained.

Prices remain the same as shown in last week's schedules, all furnaces holding stiffly to the recent advance. Some special grades of No. I X are being sold above $14.25, the maximum given in the appended schedule. We quote as follows, f.o.b. Buffalo, for current and last-quarter delivery:

No. 1 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50 to 13.75
Gray forge	13.50 to 13.75
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Most sales agencies report less active conditions prevailing in finished products than a week ago. Others report a fair business with steel bars and plain structural material in the lead, and one of the larger interests states it has enjoyed exceptionally good business for this time of the year, the business placed during the past two weeks having been greater than for any like period for some months. Prices are stable in this district, all agencies disclaiming any shading on their part and stating that nothing lower than 1.25c. for soft steel bars and 1.35c., Pittsburgh, for plates and shapes is quoted. In fabricated material a good volume of business is developing right along and prospects are exceptionally bright for continued good business through the fall months. Bids are soon to be received for the steel superstructure for the 15-story office building to be erected here by the New York Telephone Company and calling for 1000 tons, for which the contract for the foundation work has just been let. Plans are being completed for an 8-story office building to be erected by the Buffalo Natural Gas Fuel Company, taking 400 tons of steel, and bids are being taken for 100 tons required for the Erie County Lodging House, Buffalo. Bids are also about to be asked for steel for a 6-story addition to the Monroe County Court House, Rochester, and for a large foundry and warehouse to be erected at Whitesboro, N. Y., by the Munson Bros. Company, Utica, both involving considerable tonnages. The George Kellogg Structural Company, Buffalo, has been awarded contracts for fabricating and erecting steel for an addition to the Defiance Paper Company's mill at Niagara Falls, for a nurses' home for the Children's Hospital, Buffalo, and for Plymouth Methodist Church, Buffalo, aggregating about 300 tons. The Buffalo Structural Steel Company, Buffalo, has received the contract for 100 tons for the Memorial Hospital, Niagara Falls; the Durolithic Company, Buffalo, the contract for the Home Economics Building for Cornell University, Ithaca, 200 tons, and the Eastern Concrete Steel Company, Buffalo, contract for the Poultry Building to be erected by Cornell at Ithaca, 100 tons. Josiah P. Wright, contracting engineer, Buffalo, was low bidder for furnishing and erecting steel for the Buffalo General Electric Company's 17-story office building, per revised plans calling for 1400 tons.

Old Material.—The demand from mills and foundries continues fairly active in most grades with the market showing a somewhat firmer tone. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.75 to 7.25

The German Iron Market

The Bar Situation a Feature

BERLIN, July 28, 1911.

The market reviews still give conflicting reports as to trade conditions. The official report of the last trading day of the Düsseldorf Exchange used the words, "Bar iron more active at rising prices," and quite a controversy has arisen in the press as to the correctness of this description. Some of the reports positively assert that an improvement in the bar trade, both as to prices and activity is perceptible; but other authorities, apparently of equal weight, deny this with similar positiveness. Thus the leading newspaper of Essen, which had distinguished itself up to a recent date by printing more pessimistic market reviews than any other newspaper in the country, now prints a letter from somebody "in the foremost circles of the trade" which says that an upward movement in bar prices can no longer be denied; and the Frankfurter Zeitung, whose financial and trade reviews stand in high repute, also reported about ten days ago that a slight improvement was visible. On the other hand, the two foremost papers of Cologne, the Koelnische Zeitung and the Koelnische Volkszeitung, both of which make a specialty of iron market reporting, scout the idea that any improvement can be seen; and they quote prices to prove their contention. In opposition to the Düsseldorf Exchange's latest quotation of 99 to 105 marks, against 98 to 103 marks for the previous quotation, the Koelnische Zeitung now asserts that it has seen offers of bars at 99 to 100 marks from some of the big establishments; and that dealers are still selling at 97.50 marks. It adds that one great concern has just reduced its price below 97.50 marks. The other Cologne newspaper quotes similar figures. The former paper further refers to the bad conditions prevailing in the band iron and rod and wire trades as proof that general iron market conditions are not so rosy as described by some writers.

Pig Iron Syndicate Makes Progress

It is at last possible to report substantial progress toward the completion of the Pig-iron Syndicate. An arrangement has been effected with the Gutehoffnungshütte, under which it withdraws its demand for an addition of 40,000 tons to its allotment, with the understanding that it may buy a part of the allotments of several other furnaces. An agreement has also been reached with the Mathildenhütte, which several weeks ago had served notice of its withdrawal. Progress has also been made in the negotiations with the Luxemburg-Lorraine group. Many of the big companies on the lower Rhine also have branch establishments in Luxemburg or Lorraine; and they have already agreed to bring in their furnaces situated there. Negotiations with the establishments operating exclusively in Luxemburg and Lorraine are still in progress, but it is believed that their completion will occur within a week or two. The Norddeutsche Hütte, the new furnace company near Bremen, and the Geisweider and Hüste-

THE IRON AND METAL MARKETS

ner concerns have not yet been brought to terms, but negotiations are continuing.

The completion of the syndicate looks now so certain that the stock markets have begun to reckon with it as an accomplished fact, and considerable buying of iron shares has been observed on some days. Of course stock operators take an optimistic view of the meaning of the completed and enlarged syndicate, but the financial press is warning them that they can easily exaggerate the importance of the event. It is expected, indeed, that one of the first acts of the syndicate after its renewal will be to advance pig-iron prices; but, on the other hand, a restriction of the output of the furnaces is also looked for. For the present such a step would hardly seem to be called for, as it does not appear that stocks of iron are accumulating anywhere, and the trade reviews mention the fact that goods on order are being called for for delivery at a satisfactory price. It is even asserted that the furnaces, in anticipation of the completion of the syndicate, are demanding somewhat higher prices on supplementary orders for 1911 delivery. The waste and scrap-iron market remains in a rather depressed state, owing to the increase of supplies at the end of the business year.

Questions Before the Steel Works Union

The Steel Works Union held its monthly meeting yesterday under more interesting circumstances than usual. The well-known Saerbrücken firm of Gebrüder Stumm again came forward with a demand for a 10 per cent. increase of its allotments in rods and bars. At the same time a resolution came up to reduce the price of steel material for further manufacture by 5 marks per ton, to take effect as of July 1. The latter resolution emanated from the mills running on finished goods and dependent upon other establishments for their steel supplies—a class of mills that is perennially in a state of more or less acute distress. The meeting rejected the motion to reduce the price of steel material for the current quarter, and postponed a decision as to the December quarter till the next meeting at the end of August. All applications for increased allotments were voted down. An attempt in the Band Iron Association to raise prices failed in view of the unsatisfactory market position of this specialty.

The Gutehoffnungshütte of Oberhausen, on the Rhine, has taken a contract to build a steel bridge across the Rhine at Cologne. This will keep its bridge construction department busy for a year. The Gewerkschaft Deutscher Kaiser (Thysseris concern) has just put into blast one of its renovated furnaces. It has also just put into operation a plate mill for medium and thinner qualities.

The reports from the Belgian trade continue to brighten. Bars have further risen to £4 14s. and £4 15s. per ton for export.

It is reported in the German press that a combination of all the furnaces in Northern France is projected to regulate production and prices. Headquarters will be at Valenciennes.

St. Louis

ST. LOUIS, MO., August 7, 1911.

In old material a rather remarkable activity prevails, with higher prices ruling. A good general movement is noted in pig iron, structural steel, coke, etc., but no new business of especial size is apparent either in the inquiries or in the contracts. The ability of consumers to get what they want on immediate delivery is keeping many of them from taking any interest in futures, especially as there seems no strong probability of a change in the present situation.

Pig Iron.—The movement during the week has been chiefly on specifications on contracts and on small orders, carload lots, etc., for immediate delivery. The aggregate mounts up to a very fair total, but nothing in any of the component items is of especial moment. The order for 10,000 tons of basic mentioned last week has not yet been placed. The quotations on pig iron remain about as last given. In some instances the quotations are firmly held—by those who have loaded up on all the cheap business they want for the present. In No. 4 Southern there is some competition with scrap, but nothing to call a feature of the situation.

Coke.—On requisition and on small orders for immediate delivery coke is moving rather freely, with the quotations running $2 to $2.25 at oven for Connellsville or Stonega best 72-hr. selected, for last half delivery, with a tendency to make the price $2.25 to $2.50 for the first half of 1912. The smaller foundries are taking steady quantities, but none of the large consumers is in the market to any extent.

Finished Iron and Steel.—Good conditions prevail in the market for finished products, but there is no one thing that can be characterized as of especial moment. In standard rails the large order of the week was one for 2000 tons for the Southwest; another for 500 tons was taken to go west. These went at the regular figure and will be given prompt delivery, the mills being in good shape to do so. In structural material there is a steady movement of fair proportions, but nothing large. There is some placing of plates, but bars continue to be affected by the differential in favor of iron. In light rails the coal companies continue to show activity, and one fair-sized order was placed during the week by a lumber company. Track fastenings continue firm and in good movement, considering the period of the year.

Old Material.—Scrap has had the boards this week for interest, there having been some very active competition for the railroad material that came out. The Missouri Pacific's 1500 tons mentioned last week and 1000 tons for the Wabash and 500 tons for the Cotton Belt were sold at good prices, better, in fact, than the market. The chief interest is in steel scrap, and quotations generally show an unusual activity. Part of it is speculative, but the speculative disposition seems to be based upon a considerable demand, which promises to become larger according to present accounts. Dealers are watching things very closely and buying up everything they can get hold of at the new prices. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

New York

NEW YORK, August 9, 1911.

Pig Iron.—Foundries in this district appear generally to have a supply of iron for this quarter and there is little concern about purchases for the last three months, while practically no interest is taken on either side of the market in buying for 1912. A few hundred tons of malleable are involved in one inquiry from New England, but pipe foundries are the only melters willing to take on any large tonnage. These as a rule want lower prices than furnaces are entertaining. Buffalo sellers are more generally asking $13.50 for No. 2 X for delivery through the year and in some cases a higher price has been quoted. There has been little movement in Virginia iron apart from the recontracting due to the blowing out for repairs of one furnace which had little stock on hand. Eastern Pig Iron Association stocks declined considerably in July, but the supply is still ample and little change in price is to be expected in the immediate future, though makers are rather more hopeful. Some inquiry is up for basic iron for first quarter delivery in Eastern Pennsylvania. We quote as follows for Northern iron, tidewater delivery: No. 1 foundry, $15.25 to $15.50; No. 2 X, $14.75 to $15.25; No. 2 plain, $14.50 to $14.75. On Southern No. 1 foundry we quote $14.75 to $15.25 and on No. 2, $14.25 to $14.50.

Finished Iron and Steel.—The outlook for the immediate future has brightened considerably, though the week's business has been no better than usual. A decision permitting the third tracking of some of the elevated railroad lines of New York; consideration by the authorities of a project to erect an elevated railroad

THE IRON AND METAL MARKETS

structure in West street; recurrence of the talk on the Hell Gate connecting railroad bridge, and the steel requirements of the new subways of New York help to accentuate the good feeling. So far as the subways are concerned, it is widely believed that the structural material has already been closed for most of the general work awarded. The bar iron business has felt the low prices which have been obtaining in steel bars, but purchases have not been large and there is further talk of price stiffening. The largest new structural proposition appearing is the Filene building, Boston, D. H. Burnham & Co., architects, requiring 5000 to 6000 tons, and bids for general contract to be in probably by August 17. Of structural awards may be mentioned: Apartment house, Seventy-eighth street and West End avenue, for the Cambridge Construction Company, 600 tons, to Ravitch Brothers; Manhattan Soap Company, 000 tons, to William Crawford; McKeon loft building, West Twenty-fifth street, 1200 tons, to Alfred E. Norton Company. Plate mills are running at probably about 60 per cent. capacity. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—General conditions have not changed, and carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater. The one public letting of importance was for 1700 tons, New Bedford, Mass., scheduled for August 8.

Old Material.—The movement of scrap is very light. A number of Eastern rolling mills are practically closed, and there are considerable accumulations of mill scrap in the hands of dealers. Foundry operations continue on about the scale that has prevailed during the summer and current shipments of cast scrap are on a very moderate scale. The past week has shown quite a little demand for old wrought pipe, but the sales have not been sufficient to make any change in the price. There is no inducement to speculate on a market such as has ruled in recent weeks. Steel works operations in eastern Pennsylvania have been on about a two-thirds basis, and for the small amount of scrap the mills have been taking of late, in lots of, say, 400 to 500 tons they have not been willing to pay more than $13 delivered. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.00 to $11.50
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings	7.00 to 7.25
Wrought turnings	7.25 to 7.75
Wrought pipe	10.75 to 11.25
Old car wheels	10.75 to 11.25
No. 1 heavy cast, broken up	10.75 to 11.25
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.50 to 11.00

Ferroalloys.—Fully 2000 tons of ferromanganese has been sold in this market recently at $37 Baltimore. There has been quite a buying movement in ferromanganese and it is estimated that about 7000 tons has been disposed of in the last few weeks. The market for ferrosilicon seems quiet here, and dealers are practically out of the market, as they are asking much higher prices than it can be obtained for in Pittsburgh.

Metal Market

NEW YORK, August 9, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
Aug.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
3	12.75	12.62½	42.15	4.50	4.45	5.90	5.70
4	12.75	12.62½	42.45	4.50	4.45	5.90	5.70
5	12.75	12.62½	.....	4.50	4.45	6.00	5.80
7	12.75	12.62½	42.70	4.50	4.45	6.00	5.80
8	12.75	12.62½	43.00	4.50	4.45	6.00	5.80
9	12.75	12.62½	43.00	4.50	4.45	6.00	5.80

The copper market has strengthened in tone as the result of the July statistics showing a decrease in production and stocks. Pig tin is very scarce in New York and a premium is demanded for spot stocks. Spelter has advanced 10 points. Lead is strong.

Copper.—There has not been enough buying of copper since the announcement of the Copper Producers' statistics for July to test the market, but copper is decidedly firmer in tone. The favorable statistics, which show a noticeable decrease in production, a substantial increase in exports and a decrease of nearly 20,000,000 pounds in stocks, brought about a very cheerful feeling among the sellers, and it is believed that consumers will shortly come into the market. Judging from the inquiries a number of large consumers of electrolytic copper are rather short of stocks. The London market has strengthened noticeably in the last two days, and this morning spot copper there was bringing £56 10s. and futures £57 5s. Exports continue heavy, aggregating so far this month 5660 tons. Prices of Lake and electrolytic copper have not changed in New York as yet, but are liable to go up if any call for the metal develops.

Copper Averages.—The Waterbury average for July was 12.75c. The average price of Lake copper in New York during the month was 12.78c., and the price of electrolytic was 12.58c.

Pig Tin.—Pig tin for spot delivery is very scarce in New York and a premium of ¼c. is demanded. All the available tin is practically in the hands of one party, and considering that there is only 1140 tons at dock and no more is expected to arrive this week spot tin is liable to go considerably higher. There is only 1413 tons of tin afloat and most of it will not arrive until late in the month. The arrivals so far this month have been 1628 tons, but most of this metal was contracted for before it was unloaded. There is no great demand, and what little trading there was done during the week was practically between dealers. Pig tin this morning was 43c., which is an advance of 1c. over last week's prices. The London market shows signs of advancing, and this morning spot tin was sold for £194 and futures for £189, which is an advance of £3 over last week's price for spot.

Tin Plates.—There is a good, steady call for tin plates and can manufacturers are beginning to prepare specifications for their fall needs. The price is unchanged at $3.94 for 100 lb. coke plates. The price of foreign tin plates is unchanged at 13s. 9d. at Swansea, Wales.

Lead.—Some rather sensational buying has been done during the week, and it is believed that the purchases were made by a leading selling interest. It is inferred that the buying was prompted by a desire to steady the Western market, which has an upward tendency. Western dealers have been considerably excited over the shortage of lead in the East, where independent sellers have disposed of most of their holdings. The consumers do not seem to be taking much interest in the situation and prices are unchanged at 4.45c., St. Louis, and 5.50c., New York.

Spelter.—Spelter has advanced 10 points during the week and promises to go higher. A number of Western sellers who have been trying to advance the market within the last three weeks seem to have succeeded in their efforts, as consumers who were holding off have been obliged to begin to buy. According to reports from St. Louis this morning the market there promises to go higher. For the first time this year spelter has been bringing 6c. in New York within the last two days and it is selling at 5.80c., St. Louis.

Antimony.—Hallett's antimony has declined to 7.75c. and the market threatens to go lower. A great deal of antimony has been put on the market of late by speculators who purchased several months ago in the hopes of realizing on the expected success of the syndicate. Their deductions proved wrong, however, as the syndicate is now branded an entire failure. There is only a small jobbing demand for antimony. Cookson's continues firm at 8.50c., and Hungarian and Chinese grades are offered at 7.75c.

Old Metals.—Consumers are not buying freely, but dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

AUGUST 7.—A slowing down in the rate of production has produced a firmer situation in spelter and

THE IRON AND METAL MARKETS

prices are slightly higher. Advances are also asked for lead. Trade has been less active if anything and buying is decidedly spotty in character. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 43.50c.; small lots, 45.50c.; lead, desilverized, 4.52½c. to 4.55c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.85c. to 5.90c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUGUST 7.—Metals are still on the upward turn in this market, lead and zinc especially, these being affected by the demand and also by the heavy rains in the Joplin district which have flooded the mines and cut the ore production for the time being at least 50 per cent. Lead is in excellent demand at 4.47½c. to 4.50c., Missouri brand. Spelter has climbed to 4.82½c. to 4.85c., with the end not yet in sight. Tin is higher at 42.85c., while antimony, Cookson's, is steady at 8.85c. Copper is firm at 13.10c. for Lake and 13c. for electrolytic, with the demand good for all these metals. Reports from the Joplin district report zinc ore inactive the past week at $38 to $41.50, but the new week's quotations are expected to go well above that figure. Lead ore there is strong at $58 to $60. Calamine brought $22 to $24. Old metals are quoted: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, August 9, 1911.

The highest prices realized for industrial stocks since last week's report were those of Wednesday, August 2. In the three days following prices showed a continued decline, attributed in some quarters to the fear that the investigation of the United States Steel Corporation would have more serious results than had been anticipated. Some of the declines were marked, particularly in Allis-Chalmers preferred and Bethlehem Steel common. There was some variation in crop estimates, but nothing to create a really pessimistic feeling. The range of prices on active industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	6 - 8	Pressed Steel, com..	33¾ - 36½
Allis-Chalm., pref...	21¾ - 27½	Pressed Steel, pref.	100 -102
Beth. Steel, com...	31½ - 37⅜	Railway Spring, com.	34 - 36¼
Beth. Steel, pref...	60 - 63⅝	Republic, com.....	27½ - 29½
Can, com.....	10 - 11	Republic, pref.....	92½ - 94⅞
Can, pref.....	84½ - 87	Sloss, com.....	48 - 49
Car & Fdry., com..	53½ - 56½	Pipe, com.....	15 - 15¼
Car & Fdry., pref.....	117	Pipe, pref.....	53 - 53½
Steel Foundries.....	38 - 39	U. S. Steel, com...	73½ - 79⅛
Colorado Fuel	30 - 31	U. S. Steel, pref...	116¼ - 118
General Electric....	154¼ - 162	Westinghouse Elec..	64½ - 72½
Gr. N. Ore Cert...	52½ - 57¼	Va. I. C. & C.....	82
Int. Harv., com....	118 -122	Chi. Pneu. Tool....	48½ - 51½
Int. Harv., pref....	124¾ - 125	Cambria Steel	45 - 46⅝
Int. Pump, com....	37½ - 40⅛	Lake Sup. Corp....	24⅞ - 26
Int. Pump, pref....	87½ - 87⅞	Pa. Steel, pref.....	106
Locomotive, com....	37½ - 39¾	Warwick	10
Locomotive, pref.....	106	Crucible Steel, com.	12 - 12¾
Nat. En. & St., com.	17½ - 19	Crucible Steel, pref.	80⅞ - 82½
Nat. En. & St., pref.	97 - 98½	Harb. Wk. Ref., com.....	26⅛

In oil burning furnaces there is no fuel bed the friction of which must be overcome by a lofty chimney to create the draft necessary to overcome the friction. In a short discussion of the subject at a San Francisco meeting of the American Society of Mechanical Engineers, K. G. Dunn, vice-president of Hunt, Mirk & Co., San Francisco, explained that there are many stacks operating successfully on this account of 50 per cent. of the sizes for chimneys given in Kent's Mechanical Engineer's Pocket Book.

No. 1 furnace of the Shenango Furnace Company, Sharpsville, Pa., is to be relined by William McIntyre & Sons, Sharon, Pa., and is expected to be ready for blast about August 15.

The Youngstown Sash Weight Company, recently organized at Youngstown, Ohio, has started work on a new plant at Girard, Ohio, to manufacture sash weights.

Lake Superior Iron Ore Shipments in July

The shipments of iron ore from upper lake ports in July amounted to 5,221,373 gross tons, as against 6,945,289 tons in July, 1910, a falling off of 1,723,916 tons or 24.82 per cent. The Soo Line shipments from the Cuyuna range to Superior were 67,167 tons in July, with a total of 101,947 tons to August 1. This range was not a shipper in 1910. The shipment by ports in July, 1910 and 1911, and the totals to August 1 are as follows, in gross tons:

			To August 1,	
	July, 1911.	July, 1910.	1911.	1910.
Escanaba	644,098	725,123	1,711,806	2,464,859
Marquette	309,438	573,632	843,177	1,723,877
Ashland	439,843	718,309	1,102,263	2,233,864
Superior	1,747,364	1,262,468	4,698,855	3,895,303
Duluth	1,108,316	2,344,226	3,158,450	7,441,488
Two Harbors	972,314	1,321,531	2,549,740	4,104,158
	5,221,373	6,945,289	14,064,291	21,863,549

The shipments to August 1 this year are thus 7,799,258 tons or 35.67 per cent. less than to August 1, 1910—a very marked falling off.

High efficiency with oil-burning steam boilers is shown in a paper read by B. R. T. Collins, Boston, Mass., before a meeting in Boston in April, 1911, of the American Society of Mechanical Engineers. An average of seven tests of a boiler at Redondo, Cal., showed an efficiency of 80.47 per cent., 15.23 lb. of water, being from and at 212 deg. F., being evaporated per pound of oil, the oil corrected for moisture. The highest efficiency was obtained when the boiler was running at 109.2 per cent. of the builders' rating of 604 hp., and the efficiency was 83.3 per cent. and the water evaporated per pound of oil was 15.81 lb. The average percentage of carbon dioxide in the gases was 13.2; the excess of air 21.2 per cent., and the steam used by the burners 2.15 per cent. The heating value of the oil, which was obtained from the Los Angeles fields, was corrected for moisture, 18281 B.t.u. per pound.

The steamship Themis unloaded last week at the ore dock of the Philadelphia & Reading Railroad, Port Richmond, Philadelphia, 12,500 tons of Wabana ore in 66 working hours. This unloading plant is now operating in a most satisfactory manner, and it is expected that even better records will be made in the near future.

It is expected that the second furnace which the Inland Steel Company is now building at Indiana Harbor, Ind., will be ready for operation in January, 1912.

The blast furnace of the Wheeling Steel & Iron Company at Martins Ferry, Ohio, is out of blast for relining and is expected to resume about September 1.

The Pennsylvania Equipment Company, Philadelphia, is in the market for 800 ft. of 16-in. B. & S. cast-iron pipe to stand 100 lb. pressure.

The Dodge Mfg. Company, Mishawaka, Ind., gave its employees an outing to Michigan City, Ind., on July 29, the attendance being fully 3000. This was the fifth annual event of the kind. A street parade was headed by M. W. Mix, president of the company, followed by the Century Club, which is composed of about fifty employees who have been with the company more than twenty-five years.

The new works of the Union Drawn Steel Company at Beaver Falls, Pa., has been completed and a number of machines in it are in operation. All the equipment needed for this plant has been purchased. The company's other two plants, also at Beaver Falls, are in operation.

A patent on a toggle drawing press, granted July 25, has been assigned to the E. W. Bliss Company, Brooklyn, N. Y., by William Klocke and Frederick Orton. Among other things the patent covers a reciprocating blank-holding table. The patent number is 998,968.

Tod Furnace of the Youngstown Steel Company, Youngstown, Ohio, was blown out last week for relining and will be idle about six weeks.

The Steel Corporation Investigation

Testimony of Charles P. Perin, John A. Topping, Charles M. Schwab and Others

Charles P. Perin Testifies

Continuing the hearing in New York City, the Stanley Committee had before it on August 1 Charles Page Perin, William M. Given, and Walter Moore, engineers, who examined the Tennessee Coal and Iron property in 1904 for the proposed consolidation of the Tennessee Coal, Iron & Railroad Company, Republic Iron & Steel Company, and Sloss-Sheffield Steel & Iron Company. This consolidation was never effected. Mr. Perin submitted the report made at the time and explained to the committee technically how they arrived at their conclusions.

Mr. Perin used a map of the Birmingham district, showing the tonnage of ore and coal owned by the three companies referred to his report in explaining the mineral deposits.

The Tennessee Company's Great Ore and Coal Supply

The iron ore of all kinds owned by the three companies totaled 539,810,800 tons, divided as follows: Tennessee Coal & Iron 76.5 per cent., Sloss-Sheffield 14.4 per cent., Republic 9.1 per cent. Total of coal deposits was 2,377,128,400 tons, divided as follows: Tennessee Coal & Iron 68.22 per cent., Sloss-Sheffield 24.48 per cent., Republic 7.3 per cent. Coking coal amounted to 1,532,350,800 tons, as follows: Tennessee Coal & Iron 64.8 per cent., Sloss-Sheffield 25.7 per cent., and Republic 9.5 per cent.

While the report was made in 1904, the totals are practically the same as when the Tennessee Company was absorbed by the Steel Corporation.

Mr. Perin said that the report had been based on the records of all the companies which had been at the disposal of himself and his confreres, showing bore holes, drillings, and actual production. All doubtful veins or those too thin to be merchantable had been cast aside. In other words, he thought the report, while founded upon estimates in a sense, had facts as a basis. He spoke of the proximity to one another of all the raw materials necessary to make pig iron.

"That means," asked Chairman Stanley, "that all these materials necessary for the production of pig iron are found within a total radius or haul of 25 miles."

"Yes, about that," responded Mr. Perin. He then agreed that there was no other region in the world where this condition was to be found as applied to large bodies of ore. He added that the cost of production in the Birmingham region was $4 a ton less than in Pittsburgh, for instance, by reason of this condition. He thought that Birmingham's cost was $3 a ton cheaper than that of any other iron-producing district in the world. But he said: "To this you have to add $3 or $4 a ton freight for every ton of pig iron that goes out of the Birmingham district on account of no local market."

"What was the value of the 400,000,000 tons of ore, the 1,600,000,000 tons of coal and the tonnage of limestone in the Tennessee Coal & Iron property compared with that of equal deposits anywhere else in the world?" Mr. Stanley asked the witness. He replied by pointing out that the value of the deposits depended greatly on the amounts expended to develop the plant and bring about cheap cost of production.

Mr. Perin was asked about the report made in 1904 by Chief Engineer Phillips of the Tennessee Company, putting the cost of production of pig iron by the company at $6.25 per ton. He said that he could not verify Mr. Phillips' figures, but had always considered him as conversant with the mining situation and qualified to figure such a result.

The Company's Need for Money to Put in Its Plant

"Was not the Tennessee Company seeking for money to put into its plant at the time when this report was made?" witness was asked.

"There was never the time when the company was not seeking for money to put into its plant," replied the engineer, with a smile.

In the afternoon Messrs. Given and Moore, engineers who collaborated with Mr. Perin in preparing the report mentioned, confirmed the above evidence. Mr. Given said that while he knew of free undeveloped ore fields which appeared very promising, there was no incentive to the opening of a furnace by another company in the Birmingham district, as there was only a negligible quantity of ore now purchasable.

Mr. Perin was then recalled to the stand. Here the investigation touched on the deposits of ore in Cuba. The Cuban ores, he said, were of high grade, and especially useful in rails owing to the high percentage of nickel and chromium in the ore. The Western Maryland Railroad had worked out a project by which eastward-bound coal cars could be returned with Cuban ores at cost, so as to bring them into the Pittsburgh market at a fair profit. So far this has not met with large success, for the reason that Pittsburgh furnacemen anticipate the same smelting difficulties which were formerly experienced with Mesaba ores.

Mr. Given, who lives in Birmingham, was also questioned as to the real estate value of the land, aside from its mining rights, and testified that it was worth from $20 an acre in some places to $2,000 an acre in the vicinity of Birmingham. The total holdings amounted to about 500,000 acres. The purpose of all this, although no conclusions were drawn during the hearing, is to show that the ore was worth at least 35 cents a ton, or about $140,000,000, and the coal 5 cents a ton, or $80,000,000 more, making a total of at least $200,000,000, aside from the value of the land, instead of the $30,000,000 the Steel Corporation paid for it. This, some of the committeemen think, would support the theory that the Steel Corporation forced the sale and got the property at a bargain.

Grant B. Schley, the Broker, Testifies

The most striking feature of the testimony of Mr. Schley, of the brokerage house of Moore & Schley, given August 3, was his statement that acquisition of the Tennessee Company had never been urged by him as the only step possible to save his firm and avert further panic. The situation in reality seemed to have arisen because of the difficulties following the formation of a second syndicate which has just come to light, and on account of which Moore & Schley became overextended. The first syndicate has frequently been referred to in the previous testimony. The second syndicate was formed to take 50,000 more shares of the Tennessee stock. Besides certain members of the first syndicate, the second had about 30 new members. Each member of the second syndicate paid up for his shares and took them over. The price of the 50,000 shares was 130. Neither Mr. Hanna nor Mr. Gates had any share in the second syndicate. The block which it acquired was mostly taken from George Kessler, who, the witness said, was in distress at the time.

Controlled Practically All the Stock

It developed from questions put by Representative Danforth that Mr. Schley and his allies owned holdings in the syndicate and out of it amounting not merely to control of the Tennessee Company but to almost exclusive possession of the stock. The witness then told of the large size of the firm's borrowing, stating its total at about $35,000,000, of which Tennessee stock represented in the collateral from $5,000,000 to $6,000,000.

Then Representative Littleton undertook to find out from what quarter the pressure came for the elimination of Tennessee stock from Moore & Schley's collateral, to which has been attributed the necessity of selling it or exchanging it for Steel Corporation bonds.

Q.—What banks requested the elimination of Tennessee stock? A.—I can't answer that. Such requests would come to my cashier. I don't remember any specific instance.

Q.—Was there ever any such demand made by any bank? A.—Only in a general way. The same objection applied to other industrials. Republic stock, for instance, was reduced among the collateral, though not to the same extent.

Q.—Was there any more demand that Tennessee be withdrawn than other industrials? A.—No.

Q.—Did your cashier report that Tennessee had suddenly become unacceptable? A.—Only to the same extent as other industrials.

Q.—Was there a general demand that Tennessee be taken out of existing loans and a refusal to accept it in new loans? A.—There was no difference between that stock and any other industrial stock.

Q.—Was there ever a refusal by any bank to accept Tennessee or a demand that it be withdrawn? A.—I can't remember any specific instance.

Q.—At the time of the panic what caused the obpection to it? A.—Chiefly its position marketwise. Some bankers wouldn't have anything to do with it.

Q.—Was there a general attack on Tennessee or a general drive, as it has been called? A.—I never knew of any.

Corroborates the Ledyard Testimony

Mr. Schley corroborated Mr. Ledyard's testimony as to an exchange of securities with Colonel Payne. The examination by Representative Littleton continued, in part, as follows:

Q.—Then Moore & Schley were not attacked solely because of their ownership of T. C. & I.? A.—No.

Q.—If there was no drive against T. C. & I. and the rumors regarding Moore & Schley were groundless, in what way was the exchange of the stock for Steel Corporation bonds necessary to save Moore & Schley from failure? A.—We had $35,000,000 in loans and our customers were borrowing from us on T. C. & I., which was unmarketable. When we got the bonds in exchange there was an immediate market for them. The bonds could be sold and the accounts cleared.

Q.—Why was it any more necessary to exchange the Tennessee stock than that of the Republic or any of the others which were not readily salable? A.—It wasn't.

Q.—You had just as much reason for trying to negotiate a sale of the other stocks as the Tennessee? A.—Yes; except that we had a very much larger amount of Tennessee.

Q.—Was there any particular reason why the Tennessee should be made the subject of a trade between you and the Steel Corporation? A.—It relieved my needs. It relieved every friend I had and relieved my office.

Mr. Schley corroborated Mr. Ledyard's testimony that Colonel Payne was the first to suggest the sale of Tennessee to the Steel Corporation, putting it in this way: "Colonel Payne talked to me about it for a month before the sale was made. He knew I was worried and lying awake nights. He said: 'Life is too short to be worried like this. Why not sell the Tennessee Company and be done with it?'

The Interview with Judge Gary

Mr. Schley said he asked Mr. Ledyard to see Mr. Morgan. Later Messrs. Frick and Gary came to see him, and Judge Gary said the stock wasn't worth over 60, although Mr. Schley had said it would not be sold for less than par.

"Judge Gary said that was about all he could do," testified Mr. Schley. "I said, 'Then it won't be sold.' After that Mr. Ledyard became quite active, and I saw Messrs. Gary and Frick several times. The second time Judge Gary offered 90 in bonds. At the price the bonds were then selling at this meant 75 for the stock. It had not been specified whether the first offer was in cash or bonds. We didn't get that far. I told Judge Gary that the second offer wouldn't do, and that we must have par."

Q.—What was the upshot of the conversation? A.—Judge Gary said he would see me again after the meeting of the Steel Corporation's Finance Committee, which wouldn't be held until Tuesday. This was Sunday morning. Saturday had been a pretty bad day, and I didn't like the looks of Monday. I told Mr. Ledyard and he brought influence to bear, and the Finance Committee had a meeting Sunday. Mr. Ledyard came and said it looked more favorable. Monday afternoon Mr. Ledyard told me they would pay par.

Q.—Were they reluctant to buy? A.—Judge Gary didn't want to. I never heard Mr. Frick express an opinion.

Q.—How did the sale save Moore & Schley? A.—Perhaps it didn't save us. Perhaps we would have got through anyhow.

Q.—How did it aid, then? A.—By putting us in possession of several million dollars.

Q.—How did it put you in possession of it? A.—I had borrowed from Moore & Schley as well as Mr. Kessler. I sold his bonds first and then my own. His didn't quite extinguish his indebtedness. This brought in $12,000,000.

Q.—You paid off your loan from the firm? A.—Yes. Moore & Schley took the $12,000,000 and liquidated a large part of their loans from the banks.

No Pressure from Morgan Banks

Representative Sterling of Illinois questioned the witness as follows:

Q.—Do you know of any banks connected with the Steel Corporation that were pressing you more than others? A.—No.

Q.—Were any of those known as Morgan banks pressing you? A.—No. I don't know of any banks or system of banks that were pressing me as distinguished from others.

Q.—Did any financial institution seem to make a point of discrediting Tennessee? A.—No.

Q.—Did you have a suspicion that anybody was doing so? A.—I don't remember such a thought entering my mind.

Q.—Was there any thing that would lead you to think that the Steel Corporation was trying to get hold of Tennessee? A.—I have been unable to find any such evidence.

Representative Young of Michigan asked what would have been the effect if Moore & Schley had failed. "It is hard telling to what extent it would have gone. We had 600 clients on our books who would have suffered. There would have been many sales of our $35,000,000 loans. I think it would have been a very serious thing. It would have extended the panic very seriously, and might have gone into the banks."

John A. Topping Examined

John A. Topping, chairman of the Republic Iron & Steel Company, who was chairman of the Tennessee Coal, Iron & Railroad Company at the time of its absorption by the Steel Corporation, was examined August 3. Asked about the Tennessee Company he said he entered the syndicate because he thought it proper as the head of the company to take a financial interest in it. He had been impressed with its mineral resources, as shown by the report of the engineers.

In Poor Condition When Bought by Mr. Topping and Associates

"The year of our purchase," he said, "the company earned about $1,000,000. Its working capital was something over $1,000,000, but it didn't have the capital necessary to develop the property. Its physical condition was very poor, and the property was run down at the heel."

Mr. Topping submitted the auditor's report to show the condition of the company just before the merger. This report was made as the basis of the purchase by the Steel Corporation, he said. It showed a gain of 112 per cent. in earnings, and the net balance of cash was $2,000,000. A map was produced and the property gone over in detail. Then the sale by the syndicate was taken up.

Q.—Was there an understanding that the members of the stock were not to sell without the consent of the syndicate managers? A.—I felt that I was under a moral obligation not to sell and didn't sell. That was the general understanding.

Q.—Mr. Schley testified that you went with him to see Mr. Ledyard about the sale. A.—Yes; I met Mr. Ledyard at Mr. Schley's office. Mr. Schley asked me to tell Mr. Ledyard about the property. I told him the story of the work that had been done and the character of the property. I laid particular stress on the fact that the holdings were fee ownerships, and that their future value was very great. I also talked about the export possibilities. I painted the picture as I believed it existed.

Q.—Did you desire to have Mr. Schley sell the stock? A.—I did not.

Q.—What did you say to him when he asked you to talk to Mr. Ledyard? A.—I told him I couldn't go as an official representative of the company to discuss its sale, as I had no authority to do so. He asked me to go as his friend, and I said I would be glad to do so.

Q.—What was your purpose in regard to the stock? A.—My mind was rather passive. I saw no reason from my point of view why it should be sold. As Mr. Schley from his point of view said he would have to sell his stock, my purpose was to aid him to that extent. I was not representing my own stock or the stockholders. I spoke explicitly on that point.

Mr. Topping said he sold his own stock later because he didn't care to be a minority interest.

Asked what the cost of producing pig iron by his present company was he requested to be excused from answering.

Ore Freight Rates in the Northwest

Chairman Stanley then took up freight rates over the Steel Corporation's roads in the Northwest. It was shown that the Republic Company has to haul its ore from that region over either the Hill or Steel Corporation lines. He said there was no difference in rates as between the two systems. His opinion, based on that of the company's traffic manager, was that the rates are too high. They are much lower in the Birmingham district, and those in the Northwest have not been changed in many years, although the density of traffic there has greatly increased.

Q.—Is it not a fact that your company is now paying $800,000 to $1,000,000 a year in excessive charges as tribute to the Steel Corporation for the privilege of doing business over the roads? A.—I couldn't answer that without knowing the cost to the railroad per ton mile, together with a fair report. To the extent of the excess, whatever it is, we are paying tribute. I don't know how much it it. It is our opinion that the rates are too high and should be adjusted.

Q.—Do you know, or have you any advice, as to how much in money you are affected? A.—I have no data on that point.

Q.—How much, in your opinion, does it cost you? A.—That is hardly a fair statement for me to make without a knowledge of the facts.

After some discussion of this point Chairman Stanley inquired why no complaint had been made to the Interstate Commerce Commission.

"Possibly the pressure has not been severe enough up to date," said Mr. Topping, "to cause us to quarrel with our neighbor. In the old days we could stand higher rates than we can now, with the Pittsburgh district menaced by other developments. Perhaps we should not complain so long as all the manufacturers pay the same rates."

Q.—But if the Steel Corporation owns the railroad and it all goes into the same pot, does it make any difference what rate they

charge for carrying their own ore? Does it make any difference how much they pay from one pocket into another? A.—I suppose not, so long as the railroad has a profit from operation.

Q.—So far, the Steel Corporation has been benevolent in enabling you to live and pay these rates? A.—I wouldn't say that. We have lived through our own efforts.

Q.—Hasn't competition been eliminated between the steel manufacturers? A.—I haven't found it so. We are having trouble right now in meeting competition, especially in the Chicago district.

Q.—If the level of prices had not been such as they are and you had been forced to produce at a small margin of profit could you have paid these freight rates actually while the other fellow paid them constructively? A.—I don't think the question of price would have had any influence on our attitude up to this time. You must remember that all railroads are large consumers of steeel and manufacturers are not inclined to make an attack on them for that reason.

Q.—Has it reached such a state in the business that the unity of interest is such that you are indifferent as to how the railroads charge you so long as the railroads are prosperous enough to give you excessive orders through which you may recoup yourselves? A.—I didn't make any such statement as that. I spoke of our state of mind in the past. I can't say what the future may require.

"If the rates made it impossible for you to continue production wouldn't these same railroads be co-sufferers with you?" interjected Representative Young.

"They would," said Mr. Topping, "and I think they will see that it is better that their large profits should be divided with the manufacturers rather than that the ore should be left in the ground."

The Gary Dinners

Representative Beall wanted to know especially about the Gary dinners.

Q.—What is your impression as to the purpose of the Gary dinners.? A.—A general desire of the manufacturers to get together and exchange views to their mutual advantage on commercial questions—sociological, technical, and otherwise.

Q.—Are they connected with any such sordid subject as that of prices? A.—Not in a specific sense. In a general sense, yes.

Q.—Haven't the speakers appealed to the sense of honor of those present to maintain prices? A.—We were not in honor bound to do anything except to take care of our own business.

Q.—Wasn't something said about a moral obligation more binding than a written agreement would be? A.—There may have been something of that kind said by some speaker. It was like the remarks you often hear in other after-dinner speeches.

Q.—Wasn't there any other significance? A.—Decidedly not.

Representative Bartlett asked whether the Republic Company in reducing prices hadn't broken the golden rule established in the trade by the Gary dinners. Mr. Topping said he was not conscious of having broken any golden rule of that sort.

Q.—Are you in favor of Government regulation such as Judge Gary favors? A.—I have no special desire to have the Government run my business. I'm afraid I'll lose my job if it does.

Q.—Then you're not as good a socialist as Judge Gary? A.—I'm not quite in accord with him on that proposition.

Q.—Were you appointed a delegate to the Brussels conference? A.—I was asked to be a delegate, but had declined long before we made our reduction in prices.

Q.—Did you notify Judge Gary of those reductions? A.—I think I did informally.

Q.—Why was that necessary? A.—I don't know that it was, but there was no reason why we should conceal it.

Q.—There must have been some reason for doing it? A.—It was merely a matter of courtesy.

Charles M. Schwab Testifies

The hearing on August 4 was entirely taken up with an examination of Charles M. Schwab, now president of the Bethlehem Steel Company, who was the first president of the United States Steel Corporation. Asked whether he had not made the first suggestion of forming the great corporation, Mr. Schwab told what he had said in a speech at a dinner given to him at the University Club, New York, in the fall of 1899, while he was president of the Carnegie Steel Company. Prominent business men and financiers were present. The subject he had chosen was his idea of the future development of manufactures in the United States.

"He explained in his address the very great advantages that would result in manufacture from such an organization as the United States Steel Corporation. First of all, instead of manufacturing steel as it was then manufactured by a number of companies, each of which manufactured the same lines, it was his idea that the organization, to be truly successful and to attain eminence in the business of the world, should be made of such a character that one mill could be run on one product and not one mill on 50 products, as was then the practice. He continued:

No Idea of Limiting Production

"I made particular efforts to state at that time that my idea of this great organization was not with a view of establishing any arrangement with reference to the limitation of production or the increase or maintenance of prices, but that the economies resulting from these things would be so great as to make capital invested in any of the individual enterprises much more valuable. It would not aim at limiting production, but exciting the skill of the managers to the best production. So strong has that idea been with me that at the Brussels conference I advocated that the independent manufacturers should compare their cost sheets."

"Would you advocate that in this country?" Chairman Stanley asked. "Could the manufacturers here do it without injury to each other?"

"We not only can do it," said Mr. Schwab, "but we do do it."

"Is there any reason why the Steel Corporation should refuse to give its costs?"

"Since I left the Steel Corporation I have obtained all these from them. To-day, in the steel industry, there is only about one item that is not freely exchanged, and that I wanted included. That is conversion cost—the cost of putting the raw material into a ton of pig iron. The item is not a very important one because we all know it within 5 or 10 cents; but if we had it each manufacturer could adopt the best practice of the others."

Got Mr. Carnegie to Name His Price

Coming back to the dinner, Chairman Stanley asked who were there, and Mr. Schwab mentioned J. P. Morgan, E. H. Harriman, Andrew Carnegie, and Henry Phipps.

"I went back to Pittsburgh," he continued, "and thought no more about the matter for some time. One day there was a call on the long distance telephone from John W. Gates. He asked me if I could meet Mr. Morgan in Philadelphia the next day. I said I would, but Mr. Gates advised me later that Mr. Morgan was ill, so I came and saw him at his house here. Mr. Morgan asked me to go over with him again and in more detail the substance of what I had talked about at the dinner. I spent several hours in doing so. Finally, in a day or so, he told me he was fully convinced about the advantages of such an organization as I had suggested. He asked me if I could get a price from Mr. Carnegie at which he would sell his works.

"I hadn't talked with Mr. Carnegie about my idea. I did then. I advised him that at his age and with his desires in life, chiefly philanthropic, he ought to sell his plant, and with a good deal of reluctance he finally did agree to sell it. It is my opinion that shortly afterward he regretted very much that he had made a price. I got the price and took it to Mr. Morgan, and beyond being consulted as to the value of properties and so forth, I had nothing further to do with the formation of the Steel Corporation.

"At the time and shortly after the corporation was formed, in an address before an association of bankers in Chicago, I laid great stress on the point that any consolidation based on the false assumption of maintaining or raising prices or restricting output was bound to fail."

His Idea of a Trust

The following colloquy ensued with Chairman Stanley:

Q.—Would you say that trusts are morally wrong? A.—No.

Q.—You mean industrially? A.—Economically. At that period there was much discussion of the formation of trusts, and the fundamental idea with most people was that the corporation was successful which could control the output of their industry, and people thought the chief advantage came from that direction.

Q.—Are these the means by which a trust endeavored to fix the price above the amount at which it would be placed by supply and demand—an agreement for the division of territory and restriction of output—and this enabled them to divide the swag or profit among themselves? A.—If I understand you such agreements as you mean were frequently broken, and do not constitute what I would call a trust.

Q.—I am speaking of trusts as a generic term. I am trying to get you to help me take the animal out on this table here and dissect him? A.—I will be glad to assist. My definition of a trust is very different from what you have expressed. It is this: If there were 100 manufacturers in the United States that made a given commodity and 95 of them consolidated—a definite consolidation—and restricted output and raised prices, that's what I would call a trust. What you describe was called a gentlemen's agreement. It was never made for a definite length of time. It was usually broken when anybody felt like it.

Q.—Wasn't that what made Mr. Carnegie non grata in the trade—that he would keep his mills running and get the business? A.—That is so, but conditions were different then. He had a position to win. There were older concerns. My belief is that if Mr. Carnegie was in business now with his plant established and

his position established his policy would be somewhat different, in that he wouldn't make the great sacrifice in prices that he then made. At the time he went into the steel business it was costing about $60 to make a ton of rails; to-day it costs $21 or $22. In those days there was a great opportunity for the chemist and the engineer to reduce costs that doesn't exist to-day. The most skillful men with unlimited capital couldn't reduce the price $1 a ton. That's the difference between those times and now. It would not be possible for Mr. Carnegie to pursue the same policy to-day that he did thirty years ago.

The Tariff Question

The tariff question was brought up by Representative Littleton, and Mr. Schwab was asked if he thought the Steel Corporation was able to compete with the industries of the world without the imposition of duties.

If you put conditions the same in all countries, the United States would need no protection. You need protection if you want to pay the same for labor and transportation as we do now.

Q.—Do you think we need as much protection as we have now? A.—I think we ought to have a little more. We have cheaper transportation here than in Europe, but we have much longer distances.

Q.—But without protection we could compete with England? A.—England is not a very large producer.

Q.—Do the countries which are large producers have as high duties as we do? A.—Much higher. I should say nearly double.

Q.—Is it you idea that it would be better to have Government control and if necessary the fixing of prices than to have the archaic days of destructive competition? A.—I couldn't answer that. I haven't thought it out.

Mr. Schwab was asked about the sale of rails abroad for less than at home. He said he didn't know much about it, as his company did no exporting. Asked why it should be done, he said because the foreign sales were all additional business and additional work brought to this country.

Representative Sterling asked if it were true that conditions of labor were worse in the steel industry than in other trades. Mr. Schwab said it certainly was not.

Mr. Schwab took the stand again on Saturday, August 5. Chairman Stanley produced a book containing the minutes of the meetings of the Executive Committee of the United States Steel Corporation and read from those of a meeting held soon after the Steel Corporation was organized. The question of railroad rates and rebates was discussed. E. C. Converse was reported as in favor of paying as high freight rates as the railroads could be induced to fix "if the roads give us some definite rebate." Mr. Schwab was quoted as saying that the Steel Corporation could get no better rates from a certain railroad than others could. Chairman Stanley asked him the name of this railroad but he said he did not recall it. In another extract Mr. Schwab had expressed the opinion that good rates could be obtained through the influence of certain financial interests. Chairman Stanley wanted to know what interests these were, but Mr. Schwab assured him he could not remember.

Ex-President Roosevelt a Voluntary Witness

Theodore Roosevelt appeared before the committee on Saturday morning. He had not been subpoenaed but came in response to a request of the committee. On receiving this request the day previous, he said that he had written a statement embodying his recollection of the representations made to him by Judge Gary and H. C. Frick in 1907, concerning the conditions leading to the purchase of the Tennesee Company's stock by the Steel Corporation. This statement embodied the letter written by then President Roosevelt to Attorney-General Bonaparate November 4, 1907, telling of the visit of Judge Gary and Mr. Frick, and saying that the acquisition of the Tennessee property would not raise the Steel Corporation's proportion of the steel properties of the country above 60 per cent. The President also said in this letter, referring to Judge Gary and Mr. Frick: "They asserted they did not wish to do this [purchase the Tennessee properties] if I stated that it ought not to be done. I answered that while of course I could not advise them to take the action proposed I felt it no public duty of mine to interpose any objections."

A Crisis Calling for Prompt Action

Colonel Roosevelt in the further course of his statement to the committee said:

It was necessary for me to decide on the instant before the Stock Exchange opened, for the situation in New York was such that any hour might be vital, and failure to act for even an hour might make all subsequent effort utterly useless. From the best information at my disposal I believed (and believe) that the addition of the Tennessee Coal & Iron property would only increase the proportion of the Steel Company's holdings by about 4 per cent., making them about 62 per cent. instead of about 58 per cent. of the total value in the country; an addition which by itself in my judgment (concurred in, I may add, not only by the Attorney General, but by every competent lawyer with whom I talked) worked no change in the legal status of the Steel Corporation.

Furthermore, I believed that the action was emphatically for the general good, that it offered the only chance for arresting the panic, and that it would probably arrest the panic, as it did. I answered Messrs. Frick and Gary, as set forth in my published letter, to the effect that I did not deem it my duty to interfere, that is, to forbid the action which more than anything else in actual fact saved the situation. The result justified my judgment. The panic was stopped, public confidence in the solvency of the threatened institution being at once restored.

Incidentally, I may mention that when I was in Birmingham last spring, every man I met, without exception, who was competent to testify, informed me voluntarily that the results of the action taken had been of the utmost benefit to Birmingham, and therefore to Alabama, the industry having profited to an extraordinary degree, not only from the standpoint of the business, but from the standpoint of the community at large, and of the wage workers, by the change in ownership. The results of the action I took were beneficial from every standpoint, and the action itself at the time when it was taken was vitally necessary to the welfare of the people of the United States.

In my judgment I would have been derelict in my duties, I would have shown myself a timid and unworthy public officer, if in that extraordinary crisis I had not acted as I did act. In every such crisis the temptation to indecision, to non-action is great, for excuses can always be found for non-action and action means risk and the certainty of blame to the man who acts. But if the man is worth his salt he will do his duty, he will give the people the benefit of the doubt, and act in any way which their interests demand and which is not affirmatively prohibited by law, unheeding the likelihood that he himself, when the crises is over and the danger passed, will be assailed for what he has done.

The Tennessee Company's Ore Holdings

In the course of the examination of Colonel Roosevelt following the reading of his statement, Chairman Stanley took up the question of the great increase in ore land which accrued to the Steel Corporation from this purchase of the Tennessee Company, one estimate of the value of the latter company's ore being $200,000,000.

Q.—Was it your impression that the Steel Corporation's control over products was increased only 4 or 5 per cent? A.—I am unable to say that they used the word products. The statement was made that the general policy had been to have less than 60 per cent. of the total steel holdings in the country. It is my memory that they said it wouldn't increase the holdings to more than 60 per cent. and I received some other information that it would increase them from 58 to 62 per cent.

Q.—Was it your impression that they were buying some steel mills? A.—That they were buying the Tennessee Coal and Iron plant.

Q.—Was anything said about ore properties? A.—They didn't go into details at all.

Q.—It was your impression that they were buying the plant and that there would be a small increase on the comparative output? A.—I wouldn't be sure that I formulated my impression as clearly as that.

Q.—If they had advised you that it would increase their output, say between Ashland and El Paso, 80 per cent., would you have consented even for this purpose? A.—Now you are putting a hypothetical question. What has been done in developing those properties has almost nothing to do with what they represented then.

Q.—Did they advise you that the Steel Corporation owned 75 per cent of the Lake Superior ores, and that but two great ore regions are now available, the second of which is in the Birmingham district? A.—I have already explained that nothing of that kind was touched on at all.

Q.—Commissioner Smith has stated that this is the case, and Judge Gary says the Steel Corporation prior to this absorption had spent hundreds of thousands of dollars in furnishing data to the Bureau of Corporations. So Mr. Smith had the facts on which to make this report. Did Mr. Smith ever advise you of these facts before Judge Gary and Mr. Frick came to see you? A.—He certainly never made any such report in full to me, I should doubt if he ever told me anything about the Steel Corporation. It is my memory that he started the investigation while I was President. It is my belief that he had not carried it to a point that would have enabled him to make any report to me.

Mr. Stanley also cited reports indicating that the Steel Corporation, through its ownership of railroads over which the ore of its competitors was transported, was in a position to crush them.

Q.—Did any officer of the Government ever call your attention to this traffic condition? A.—I believe not. In the matter of the coal roads similar conditions had been reported and were followed by actions, but I think if the ore roads had been called to my attention I would remember it.

Congressman Bartlett asked whether the depositing of $50,000,000 with the banks by Secretary Cortelyou and the advancing of $60,000,000 by Mr. Morgan and his associates had not really relieved the situation in 1907.

Q.—Was not the impression created in your mind that these acts had checked the panic? A.—That impression was conveyed very strongly, and they did check the panic, but there was strong reason to believe it was recrudescing—recrudescing—growing again. At that time the battle was on. I won—the Administration won. Partial victory after partial victory. If I had sat supinely down and thought the battle won we would have lost. I know that it is as near absolute knowledge as anything outside of mathematics can be.

Q.—You seem to have won Judge Gary over to your side in regard to control of corporations? A.—I hope so.

Q.—Did Judge Gary ever suggest any such control before this investigation started? A.—Not that I remember. I think Judge Gary or somebody else did in a public address back up strongly the position I had taken.

Q.—Between the anti-trust law and destructive competition he is seeking a harbor of safety? A.—Here again you are asking me to search the domain of motives. I am sure as I can be that the course I advocated for the Government to take in connection with the control of these big corporations will ultimately commend itself to the people of the United States.

Chairman Stanley asked if the witness had acquired information since the merger as to the conditions which brought it about. "Every particle of information," said Colonel Roosevelt, "that I have had since has not only convinced me that it was absolutely wise and proper, but that it would have been well nigh criminal if I hadn't done exactly what I did. I cannot state that too emphatically. I may add that my responsibility was complete and absolute."

Congressman Young asked if since he had taken this action Colonel Roosevelt had received any information that any misrepresentation had been made by Judge Gary and Mr. Frick.

"I felt that I had information," said Colonel Roosevelt, "on all the vital points in which I was concerned. It wasn't necessary for me to form any judgment whether the representatives of the Steel Corporation were anxious to get possession of the property or whether they were only anxious to save the situation caused by the panic. In all the essential representations they made to me I believed them to be accurate and sincere. They were in accord with what I had heard from New York. In so far as they affected my judgment, events exactly bore out and justified what I had been told."

A Scottish Tube Works Consolidation

Details have been arranged of an amalgamation in the Scottish tube trade, a preliminary agreement having been made by eight firms to form the Scottish Tube Company, Ltd., with a capital of £600,000. While Stewarts & Lloyds, who have for years had a commanding position in that trade, are not included in the consolidation, it is said they will be interested in the new enterprise and will name a director on the board. This company has a capital of £2,250,000 in addition to £350,000 bonds. The firms included in the Scottish Tube Company are the following:

Hendry Bros. Ltd., Glasgow and Garnkirk.
David Richmond & Co., Ltd., North British Tube Works, Govan, Glasgow.
Wilsons & Union Tube Company, Ltd., Govan Tube Works, Glasgow, and Union Tube Works, Coatbridge.
Caledonian Tube Company, Coatbridge.
Coats Tube Company, Coats Tube Works, Coatbridge.
James Eadie & Sons, Clydesdale Tube Works, Rutherglen.
John Marshall & Sons, Glasgow Tube Works, Glasgow.
Tradeston Tube Company, Tradeston, Glasgow.

For a number of years an international tube syndicate existed in which British, German and American manufacturers were represented. This association dissolved in 1908. At intervals since there have been negotiations for renewed co-operation. The London Iron and Coal Trades Review says:

"The export tube trade has been particularly busy in recent years, the export this year having been at the rate of 175,000 tons a year, or nearly double the export of six years ago. There are about 35 makers in Great Britain, and about 40 in America, while Germany has 25 makers. In other Continental countries there are about 26 makers, divided as follows: France, twelve; Russia, eight; Belgium, five; Austria, four; Spain, two; making a total of about 130 works, the trade being in the hands of many firms, but some of them turning out limited quantities, especially in Great Britain, France, and Belgium. The German and the American works are larger than our own, so that the number of works is no guide to output. The British output in 1907 was returned by the Census at just under 300,000 tons, but as exports have since increased by 50,000 tons, the present output must be assumed to have increased by nearly that amount. Our tube trade has suffered from foreign competition even in our home markets, the imports in 1910 being 20,000 tons, mainly from Germany, the United States, and Belgium. The tube industry is mainly concentrated in the neighborhood of Birmingham and Glasgow, and the Scotch works are able to place their products f.o.b. at about 2s. a ton, while those in South Staffordshire are well placed for the home trade. It is expected that the prospectus of the new company will be issued about October."

June Iron and Steel Exports and Imports

The Record Showing for the Fiscal Year 1911

The report of the Bureau of Statistics of the Department of Commerce and Labor for June shows a further decrease in both iron and steel exports and imports as compared with the figures of May. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $20,310,053 in June against $20,616,795 in May, while the value of similar imports in June was $2,777,718 against $2,736,149 in May.

The exports of commodities for which quantities are given totaled 173,818 gross tons in June against 173,920 tons in May and 119,375 tons in June, 1910. The details of the exports of such commodities for June and for the fiscal year ended with June, compared with the corresponding periods of the previous year, are as follows:

Exports of Iron and Steel.

	June		Twelve months ended June.	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	7,584	8,854	152,647	79,771
Scrap	5,741	3,940	59,505	18,448
Bar iron	1,383	1,396	18,058	16,040
Wire rods	728	2,410	17,757	24,942
Steel bars	11,500	8,444	122,847	90,506
Billets, ingots and blooms	18,982	2,241	186,700	51,554
Steel rails	32,271	25,392	391,428	369,578
Iron sheets and plates	11,208	7,728	103,818	95,621
Steel sheets and plates	18,143	10,505	200,583	139,429
Tin and terne plates	4,197	764	31,339	11,682
Structural iron and steel	19,754	15,756	176,085	120,228
Barb wire	7,470	7,167	82,951	75,020
All other wire	13,448	7,964	113,515	80,977
Wire nails	3,192	2,304	50,043	36,398
Cut nails	698	367	10,202	8,816
All other nails, including tacks	857	699	12,147	8,365
Pipe and fittings	16,662	13,444	180,673	163,776
Totals	173,818	119,375	1,910,298	1,391,151

The imports of commodities for which quantities are given totaled 29,394 gross tons in June as compared with 23,375 tons in May and 30,322 tons in May, 1910. The details of such imports for June and for the fiscal year ended with June, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	June		Twelve months ended June.	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	19,099	13,988	206,194	237,594
Scrap	2,394	2,240	26,561	118,610
Bar iron	2,281	4,109	30,415	34,077
Billets, bars and steel forms, n.e.s.	2,074	2,430	38,266	37,227
Sheets and plates	169	428	3,623	6,852
Tin and terne plates	1,679	5,449	42,553	69,003
Wire rods	1,698	1,678	18,325	15,718
Totals	29,394	30,322	565,937	519,081

The imports of iron ore in June were 118,296 gross tons against 217,467 tons in May and 193,415 tons in the month of June, 1910. The total importations of iron ore for the fiscal year ended with June were 2,133,633 gross tons against 2,381,676 tons in the fiscal year 1910. Of the June imports of iron ore 88,030 tons came from Cuba, 15,282 tons from Sweden, 12,471 tons from Canada and 2513 tons from other countries.

The total value of the exports of iron and steel and manufactures, not including iron ore, for the fiscal year ended with June was $230,725,351 against $179,133,186 in the fiscal year 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for the fiscal year ended with June was $34,205,968 against $38,506,757 in the previous fiscal year.

The figures above given for the fiscal year 1910-11 constitute a new record for our export trade, being far in excess of those of any previous twelvemonth, both as to value and quantity.

The Winters-Coleman Scale Company, Springfield, Ohio, has closed a contract with the Howe Scale Company, Rutland, Vt., by which the latter will take the entire output of the Springfield plant. The Howe Scale Company will take over the selling force of the Winters-Coleman Scale Company and a separate department, to be known as the Automatic Scale Department of the Howe Scale Company, has been organized with headquarters at Rutland.

New Officers of Westinghouse Electric & Mfg. Company

At a meeting of the board of directors of the Westinghouse Electric & Mfg. Company, held in New York on August 1, the following officers were elected:

Chairman of the Board of Directors, Robert Mather.

President, Edwin M. Herr.

Vice-Presidents: Loyall A. Osborne, Chas. A. Terry, Harry P. Davis.

Acting Vice-Presidents: Henry D. Shute, George P. Hebard.

Comptroller and Secretary, James C. Bennett.

Treasurer, T. W. Siemon.

Auditor, F. E. Craig.

Mr. Herr is elected to succeed Edwin F. Atkins, who has been president of the company since June, 1910, and who declined re-election. Mr. Herr has been the first vice-president of the company and in charge of operation of same at East Pittsburgh since June 1, 1905. He was born in Lancaster, Pa., May 3, 1860. Upon completion of a common school course, he was given the position of telegraph operator on the Kansas Pacific Railroad, with which company he remained for two years. He was promoted from the construction train service to the position of station agent.

E. M. Herr, president of Westinghouse Electric & Mfg. Company.

In 1881 he entered the Sheffield Scientific School of Yale graduating in the Class of 1884, and worked as an apprentice in the shops of the Pennsylvania Railroad Company at Altoona, Pa., during the two summer vacations. From 1884 to 1885 he was an apprentice at the West Milwaukee shops of the Chicago, Milwaukee & St. Paul Railroad. He then went to the Chicago, Burlington & Quincy Railroad Company as a draftsman in the mechanical engineer's office, and afterwards became assistant engineer of tests, and was promoted from this position to engineer of tests on this road at Aurora, Ill. From 1887 to 1889 he was superintendent of telegraphy, and from 1889 to 1890 was division superintendent of this road. From 1890 to 1892 he was division master mechanic of the Chicago, Milwaukee & St. Paul Railroad at West Milwaukee.

From 1892 to 1894 he was superintendent of the Grant Locomotive Works at Chicago. From 1895 to 1897 he was superintendent of motive power and machinery of the Chicago & Northwestern Railroad. From June 1, 1897, to September 10, 1898, he held the same position with the Northern Pacific Railroad.

On September 10, 1898, he became assistant general manager of the Westinghouse Air Brake Company at Wilmerding, Pa. He was promoted to the position of general manager on November 1, 1899, which position he held until June 1, 1905, when he was elected first vice-president of the Westinghouse Electric & Mfg. Company.

Calvert Townley, was appointed assistant to the president of the Westinghouse Electric & Mfg. Company. He was for many years connected with the company, at first in Pittsburgh and later as manager of its Boston office, and as special representative in New York City. He comes to the company directly from the New York, New Haven & Hartford Railroad Company, where for the past five years he has been closely identified with the electrification of this road.

Harry P. Davis, one of the vice-presidents, has been with the Westinghouse Company for twenty years, and for the last few years has held the position of assistant to first vice-president and manager of engineering at the East Pittsburgh works.

July Copper Production and Stocks

Nearly 20,000,000 lb. less copper was in stock on August 1 than on July 1, according to the statement for July of the Copper Producers' Association. The month's production shows there was a decrease in production in July as compared with May of 12,386,298 lb. Deliveries for domestic consumption decreased 4,672,979 lb. while exports show an increase of 3,420,139 lb.

The figures for July are as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, July 1	157,434,164
Production of marketable copper in the United States from all domestic and foreign sources during July	112,167,934
Deliveries of marketable copper during July:	
For domestic consumption	56,982,582
For export	74,880,658
Total	131,863,240
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	137,738,858

Labor Notes

Officers of the National Metal Trades Association say that the strike of the International Association of Machinists in District 15, comprising the union locals in Hudson County, New Jersey, and Manhattan, for an eight-hour working day, has been defeated. The strike was called May 1. While the union has not called it off, all the affected shops controlled by members of the Metal Trades Association are working normally and the association has been able to obtain as many men as are needed.

The Willamette Iron & Steel Works, Willamette, Ore., is reported to be putting on new men almost daily, and, while the strike of its boiler makers is still on, the company expects shortly to be operating under as good conditions as prevailed before the strike.

The Employers' and Builders' Association of Tacoma, Wash., held a meeting July 27, at which the Mayor and Commissioner of Public Safety were present. Members of the association put before these officers the facts concerning the lack of protection to the machine shops of Tacoma during the strike of union machinists. Sentiment in favor of the open shop is reported to be making good headway in Tacoma since the strike.

The Hattie Ensley Furnace of the Sloss-Sheffield Steel & Iron Company, at Sheffield, Ala., was blown out July 28. The company has blown in its Philadelphia Furnace at Florence, Ala.

The Republic Iron & Steel Company's general offices at Pittsburgh will be removed next week to the company's new office building at Youngstown, Ohio.

Alleghany Furnace at Iron Gate, Va., which was taken over from the Oriskany Ore & Iron Corporation by the Alleghany Ore & Iron Company, on the expiration of lease, June 28, was put in blast by the latter company July 5.

The Ironton Iron Company, Ironton, Ohio, completed the relining of its furnace July 10, and it is now in readiness for blowing in, but no date has been fixed, resumption depending upon business conditions.

The Taylor-Wilson Mfg. Company, McKees Rocks, Pa., is shipping one of its coupling and screwing machines to Thyssen & Co., Mulheim, Ruhr, Germany. This is the third order received from Germany for this type of machine in the past few months.

Personal

Frank J. Stolle, formerly sales manager for the Chester Steel Castings Company, Chester, Pa., in the Central West, resigned August 1 to act as sales manager for the new Armor Steel Foundry Company, Cincinnati.

The United States Steel Products Company, New York, has opened an office in Toronto. It is under the management of F. C. Brunke, formerly of the company's Buffalo office.

William Jaeger, manager of the New York office of Alfred H. Schutte, the Germany machinery selling house, has returned to this country after a six weeks' absence in Europe.

Ralph H. Pearsall, London, England, is in the United States to arrange for the British manufacturing rights of American mechanical equipment. He is making his headquarters at the Engineering Societies Building, 29 West Thirty-ninth street.

Col. Frank F. Cutting, so long associated with Hill, Clarke & Co., Inc., interests, has been elected president and general manager of the Lapointe Machine Tool Company, Hudson, Mass., the company recently having undergone a reorganization. Ralph R. Lapointe has become the broach expert of the company and will also have charge of the reamer department.

F. P. Huston, sales manager of the Kempsmith Mfg. Company, Milwaukee, Wis., has returned from Europe, where he went six months ago to investigate conditions and establish new agencies for the sale of his company's milling machines. Mr. Huston visited practically all the European countries and had a most successful trip.

R. J. Rote, formerly with the American Electric Fuse Company, Muskegon, Mich., in charge of the rheostat and crane controller departments, has entered the sales department of the Staunton Dielectrite Rubber Company, Muskegon, manufacturer of molded insulation for high and low tension.

Frank Lawrence Glynn has been made principal of the State Trade School, Bridgeport, Conn., succeeding A. P. Pletcher, resigned. Mr. Glynn has been principal of the Albany Vocational School, Albany, N. Y.

Thomas F. Du Puy, formerly with the New York sales office of the National-Acme Mfg. Company, Cleveland, Ohio, has been made sales manager for New York, New Jersey, part of Pennsylvania and the South, for the Windsor Machine Company, Windsor, Vt. He will have as an assistant Frank Greiner, who is well-known as a machine tool salesman.

G. A. Krutschnitt, formerly president of the Aluminum Goods Mfg. Company, has been elected president of the Tea Tray Company, Newark, N. J., succeeding Albert S. Marten, who has retired. J. H. B. Conger is vice-president and treasurer of the company, and H. G. Hull, secretary.

Arthur W. Richards, iron and steel works consultant and metallurgist, has opened offices in the army and navy mansions, 109 Victoria street, London, S. W., England, and announces himself prepared to represent suitable firms in London.

Hildreth & Co., New York, and the Morgan T. Jones Company, Chicago, inspecting and supervising engineers, have formed a combination effective August 1 under the title of the Hildreth-Jones Company. Morgan T. Jones will be in full charge of the Western district, with headquarters in Chicago. These companies are well known in the inspection field, Mr. Hildreth having been in business as a consulting and inspecting engineer in New York since 1888, while Mr. Jones was for ten years connected with R. W. Hunt & Co., and later for nearly seven years was president of the American Bureau of Inspection and Tests.

J. M. Jones, of Chicago, has been elected president of the Racine Tool & Machine Company, Racine, Wis. H. H. Jones remains as secretary and treasurer, and L. I. Redmond as vice-president.

James T. McCleary, New York, secretary of the American Iron and Steel Institute, who has been in Europe for several weeks, will return next week.

New Scheme for Storing Exhaust Steam

An exhaust steam storage tank partaking of the form of a gas holder, but for the same use as the so-called exhaust regenerator employed as an intermediary between a reciprocating steam engine and a low-pressure steam turbine, has been built at the Carl Colliery of the Kölner Bergwerks-Verein. In this new scheme there seem to be no trays for catching intermittent condensation of the steam, leaving the resultant water ready to deliver steam at succeeding momentary reductions of pressure.

The steam storage holder has a double wall for heat insulation purposes. The holder proper is 21½ ft. high and 27 ft. 3 in. in external diameter and is covered with the usual form of movable bell top such as one finds with gas holders, the bell top being 26 ft. high and 23 ft. in diameter. The seal between the holder proper and the bell is of water, with a layer of oil in the top to prevent evaporation of the water. In order to minimize the loss of heat through the portions of the bell in contact with the liquid, the metal is cased with a double layer of oak boards and the rest of the metal surface exposed is covered with 2 in. of asbestos.

The holder is employed in connection with a hoisting engine which in the average of 8 hours of work lifts 1050 tons from a depth of 1215 ft., and it receives also the steam from a compressor compressing 70,000 cu. ft. of air to 90 lb. per square inch per hour. The exhaust is admitted into the holder from underneath at a middle point and passes through an oil separator before reaching the storage space. The supply of exhaust steam to the low-pressure turbine is taken also from the bottom of the holder. The rise and fall of the bell, of course, accommodates the steam as regards volume, and if the volume should become too great the bell automatically opens the safety valve. It is stated that with a bell capacity of 10,000 cu. ft. of steam and a load of 500 kw. the whole of the exhaust steam from the winding engine during one lift can be accommodated, so that there is a minimum possibility of steam being wasted through blowing off.

A test for the loss of heat of the holder was undertaken by filling the holder with steam and noting the time required for the bell to descend a definite distance. It was found that the rate of condensation was about ½ lb. of steam per square yard of area per hour, which is less than 68 B.t.u. per square foot per hour.

Pig Iron Cost at One Southern Plant.—In his speech in the House of Representatives at Washington, August 2, replying to William J. Bryan's criticisms of his position on the wool tariff, Representative Underwood, of the Birmingham, Ala., district, made this reference to his connection with the iron business: "I am a stockholder in the Woodward Iron Company, located near Birmingham, Ala. It produces nothing but pig iron. It makes no other commodity. My brother-in-law, who is the vice-president and general manager of that company, stated to me a very short time ago that the company was making pig iron as cheap as, or a little below, $7.50 a ton, including all costs of every nature and description. In times past they have made pig iron as cheap as $6 a ton. That was some years ago, when the labor costs were cheaper than they are now. I say without expectation of contradiction that the furnace company in which I am interested can make pig iron cheaper than it can be made anywhere in the world."

The J. S. Bretz Company, New York, has its Western office changed to 504 Ford Building, Detroit, Mich., where J. W. Hertzler, Western representative, will make his headquarters. A full sample line of F. & S. ball bearings, German steel balls, Star ball retainers, U. & H. master magnetos, Bowden wire mechanism, Hartford universal joints and clutches, and drop forgings will be displayed there for the convenience of the Western trade.

The Lukens Iron & Steel Company, Coatesville, Pa., made a record run on one of its 50-ton open hearth furnaces in one week during July, producing 736 tons of ingots, using cold charged metal in a run of six consecutive days.

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

PRODUCTION OF PIG IRON IN THE UNITED STATES IN THE FIRST SIX MONTHS OF 1911.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons.

Production in the First Half of 1910, 14,978,738 Gross Tons; Second Half of 1910, 12,324,829 Tons; First Half of 1911, 11,665,796 Tons

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States.	Blast Furnaces. In blast Dec. 31, 1910.	June 30, 1911. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1910.	Second half of 1910.	First half of 1911.
Massachusetts	1	1	1	2	7,505	9,077	6,424
Connecticut	3	0	3	3			
New York	15	15	14	29	1,017,951	920,456	833,467
New Jersey	2	1	8	9	155,087	109,694	39,277
Pennsylvania	74	81	84	165	6,065,688	5,206,635	4,822,832
Maryland	2	3	2	5	170,708	155,506	131,531
Virginia	9	7	18	25	244 275	200,701	159,996
Georgia	1	0	4	4	6,725	8,000	.....
Texas	0	0	4	4			
Alabama	20	17	33	50	1,012,545	926,602	809,795
West Virginia	1	3	1	4	137,439	37,222	130,455
Kentucky	2	3	4	7	46,520	53,989	46,493
Tennessee	10	9	11	20	235,969	161,600	165,722
Ohio	35	35	41	76	3,210,562	2,541,550	2,740,142
Illinois	11	16	10	26	1,552,160	1,123,486	882,807
Indiana	3	6	3	9	716,832	533,271	552,056
Michigan	9	7	9	16			
Wisconsin	4	2	5	7	170,814	136,386	147,477
Minnesota	1	1	0	1			
Missouri	1	2	0	2			
Colorado	2	3	3	6			
Oregon	0	0	1	1	227,958	200,654	197,322
Washington	0	0	1	1			
California	0	0	0	0			
Total	206	212	260	472	14,978,738	12,324,829	11,665,796

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	15	15	7	22	1,017,901	920,456	833,467
New Jersey	2	1	6	7	152,975	109,694	39,277
Pennsylvania	61	72	55	127	5,088,738	4,932,343	4,671,653
Maryland	2	3	1	4	170,108	155,506	130,901
Virginia	8	6	15	21	247,731	204,611	159,485
Georgia	1	0	2	2			
Texas	0	0	3	3			
Alabama	17	16	29	45	997,206	906,237	788,895
West Virginia	1	3	1	4	137,439	37,222	130,455
Kentucky	2	2	4	6	45,963	52,988	46,159
Tennessee	9	8	10	18	234,393	159,685	164,482
Ohio	35	34	38	72	3,210,542	2,540,510	2,739,517
Illinois	11	16	10	26	1,552,160	1,123,486	882,807
Indiana	3	6	3	9			
Michigan	1	2	2	4	678,580	520,216	542,193
Wisconsin	3	1	5	6			
Minnesota	1	1	0	1			
Missouri	0	1	0	1	253,610	212,678	226,431
Colorado	2	3	3	6			
Washington	0	0	1	1			
Total	174	190	195	385	*14,382,346	*11,875,632	*11,355,722

* Includes a small quantity of ferro-silicon made with coke and electricity.

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	5	5	376,739	272,343	149,227
New Jersey	0	0	2	2			
Pennsylvania	10	6	25	31			
Total	10	6	32	38	376,739	272,343	149,227

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	1	1	1	2	*7,555	9,077	6,424
Connecticut	3	0	3	3			
New York	0	0	2	2			
Pennsylvania	3	3	4	7	2,323	1,949	1,952
Maryland	0	0	1	1	965	590	1,141
Virginia	1	1	3	4			
Alabama	3	1	4	5	15,339	20,365	20,900
Georgia	0	0	2	2			
Texas	0	0	1	1			
Kentucky	0	1	0	1	5,037	6,416	1,574
Tennessee	1	1	1	2			
Ohio	0	1	3	4	20	1,040	625
Michigan	8	5	7	12	155,740	105,065	98,232
Wisconsin	1	1	0	1			
Missouri	1	1	0	1			
Oregon	0	0	1	1	*32,674	*32,352	*29,999
California	0	0	0	0			
Total	22	16	33	49	*219,653	*176,854	*160,847

* Includes a small quantity of pig iron made with charcoal and electricity.

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	174	190	195	385	14,382,346	11,875,632	11,355,722
Anth. & anth. & coke	10	6	32	38	376,739	272,343	149,227
Charcoal	22	16	33	49	219,653	176,854	160,847
Total	206	212	260	472	14,978,738	12,324,829	11,665,796

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

	Districts.	Blast Furnaces. In blast Dec. 30, 1910.	June 30, 1911. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1910.	Second half of 1910.	First half of 1911.
Pennsylvania.	Lehigh Valley	12	13	13	26	369,529	389,721	423,788
	Schuylkill "	8	7	10	17	404,583	398,779	375,973
	L. Susq. "	8	7	10	17	358,511	284,759	225,170
	Juniata "	3	1	7	8	93,557	97,997	51,518
	Allegheny Co.	23	33	14	47	2,895,729	2,435,253	2,488,508
	Shenan. Valley	9	9	15	24	1,041,381	883,127	637,625
	Miscel. bitum.	8	8	11	19	900,075	715,050	618,298
	Charcoal	3	3	4	7	2,323	1,949	1,952
Ohio.	Mahoning Val.	14	16	8	24	1,345,926	1,189,043	1,134,795
	Hocking "	0	0	1	1	866,805	607,600	827,976
	Lake Counties	6	9	7	16			
	Miscel. bitum.	8	6	10	16	722,360	563,415	594,005
	H. R. bitum.	7	3	12	15	275,451	180,392	182,741
	H. R. charcoal	0	1	3	4	20	1,040	625

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	464,263	370,369	240,641
Pennsylvania	2,466,797	1,927,108	1,741,542
Maryland	170,108	155,506	130,901
Virginia, West Va., Kentucky, and Tenn.	184,281	84,296	173,284
Ohio	1,942,374	1,518,362	1,707,978
Illinois	1,035,681	790,726	650,066
Michigan, Wisconsin, Minn., Col., and Cal.	60,379	75,392	60,012
Total	6,323,883	4,921,759	4,704,424

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Pennsylvania.	Lehigh Valley, Schuylkill Valley	88,370	76,606	91,720
	Lower Susquehanna Valley	59,374	67,089	44,932
	Allegheny County	1,322,242	1,029,907	1,070,758
	Shenango Valley, Miscellaneous bituminous	996,811	753,506	534,132
Ohio.	Mahoning Valley	873,483	865,424	803,726
	Lake Counties	505,261	325,660	478,229
	Hanging Rock bituminous, Miscellaneous bituminous	563,630	327,278	426,023

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	274,032	140,196	158,293
Pennsylvania—Allegheny County	1,480,013	1,327,538	1,335,712
Other counties	1,228,391	1,211,123	1,128,377
Virginia, Alabama	392,559	304,818	178,012
Ohio	612,331	543,103	518,544
Indiana, Illinois, Mich., Missouri, and Col.	956,616	613,888	616,549
Total	4,943,942	4,140,666	3,935,487

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	91,381	65,218	66,577
Illinois	39,566	28,266	11,018
Total	130,947	93,484	77,595

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1906 TO 1910.

States—Gross tons.	Production—(Includes spiegeleisen, ferro-manganese, etc.) 1906.	1907.	1908.	1909.	1910.
Massachusetts, Connecticut	20,239	19,119	13,794	18,388	16,582
New York	1,552,630	1,669,752	1,019,495	1,733,675	1,938,407
New Jersey	379,390	373,189	225,372	294,474	264,781
Pennsylvania	11,247,860	11,348,549	6,987,191	10,918,824	11,272,323
Maryland	368,709	411,833	183,502	286,856	326,214
Virginia	483,525	478,771	320,458	391,134	444,976
Georgia, Texas	92,599	55,825	24,345	26,072	14,725
Alabama	1,674,848	1,686,674	1,397,014	1,763,617	1,939,147
West Virginia	304,534	291,066	65,551	228,282	174,661
Kentucky	98,127	127,946	45,096	86,371	100,509
Tennessee	426,874	393,106	200,826	333,845	397,569
Ohio	5,327,133	5,250,687	2,861,325	5,551,545	5,752,112
Illinois	2,156,866	2,457,768	1,691,944	2,467,156	2,675,646
Indiana, Michigan, Wisconsin, Minnesota, Missouri, Colorado, Washington, California	369,456	436,507	348,096	964,289	1,250,103
	373,323	322,053	148,938	348,177	307,200
	413,040	468,486	313,071	382,766	498,612
Total	25,807,191	25,781,361	15,936,018	25,795,471	27,303,567

The Michigan College of Mines, Houghton, Mich., is celebrating its quarter centennial this week. George W. Perkins, New York, had prepared an address for the first day's exercises on the topic "Wanted—A Constructive National Policy." Mr. Perkins was prevented from attending because of his engagement to testify August 8 before the Stanley Committee at Washington, and the address was read by President McNair of the university.

The Globe Iron Company, Jackson, Ohio, which has produced high silicon silvery irons for more than 25 years, is now manufacturing Bessemer ferrosilicon, which is being marketed under the brand of "Tubal-Pencost." As has been the practice with the company's Globe high silicon softener, it is stated that no shipments of the Tubal-Pencost product will be made unless within the specifications called for in silicon, phosphorus and sulphur.

A Special Coal Handling Crane

Details of a Recent Installation of the Toledo Bridge & Crane Company

At the Madison Street powehouse of the Toledo Railway & Light Company a special coal-handling gantry crane was recently installed by the Toledo Bridge & Crane Company, Toledo, Ohio. Several special conditions had to be met in the design of the crane which is rated to unload either lump or slack coal from four separate tracks at the rate of from 75 to 100 tons per hour. The coal is dumped from the crane bucket into a hopper provided with a screen which prevents foreign material from passing through the hopper into the coal crusher located immediately underneath. The crusher is of the single roll type with a by-pass. The coal is discharged from it into a screw conveyor and then into an elevator. From the discharge spout of the elevator the coal is dumped through hatchways in the roof of the power house into storage bins, which are immediately over the boiler room. This arrangement eliminates the necessity of handling the coal by manual labor and gives a very compact layout as the elevator and the crusher, although driven by independent motors, have their movement controlled from the operator's cage of the crane by a starting box. A general view of the crane is given in Fig. 1, while Figs. 2, 3 and 4 are three views of the trolley showing respectively an end view, the electric brakes and the hoisting mechanism. The drive on both wheels, which is through bevel and spur gears, is illustrated in Fig. 5, which is an end view of the truck.

The girders and the gantry legs are riveted box sections and riveted plate and angle construction is employed for the section which forms a part of the truck. The trucks proper are of cast steel, with equalizing bearings. These are four in number, two drivers and two idlers and each has two 36-in. steel wheels, both of which are drivers. The driving gears are keyed to the truck wheel axles and the truck wheel bearings are of manganese bronze and are self-oiling. The removal of the equalizing pin enables the entire truck to be detached and rolled from beneath the gantry when desired. The drive to the trucks is through bevel gears, all of which are fully inclosed in oil-tight gear cases, a view of the drive being given in Fig. 5.

Details of the Trolley

The general design of the trolley, as will be noticed from Fig. 2, which is an end view, consists of two built-up steel girder side frames, which are connected by structural steel girts with finished bolts in reamed holes. The trolley truck wheels are of cast steel and M.C.B. self-oiling bearings are used.

The driving motors are mounted on the girders at an equal distance from the ends and the connection between the cross shaft and the vertical shaft is made by bevel gears. These motors are connected in parallel and the foot brake, which is operated from the cage, is located on the main cross shaft. The two hoisting motors are controlled by plain rheostatic control, which gives ample ease in operation. When the load is being lowered both motors are braked dynamically, thus giving perfect control regardless of the load on the hook. The trolley and bridge driving motors are controlled by standard face plate controllers with self-contained resistances. The hoisting motors have a limit device, operating in connection with magnetic switches which prevents overtravel in hoisting. The motor brakes, which are illustrated in Fig. 3, are of the shoe type with cast-steel magnet frames and arms and cast-iron brake wheels and shoes. These shoes are lined with a special metal, which possesses long life and gives a high coefficient of friction. The only expense said to be incurred in connection with the maintenance of these brakes is the occasional relining of the shoes. The lowering energy is dissipated in the dynamic braking resistance and in lowering the dynamic brakes become holding brakes when the load is brought to a standstill by dynamic braking, the lowering energy not being dissipated in the trolley brakes under any conditions. The brake coils are wound with double cotton-covered wire, which is one size larger than the motor field winding and the coils are thoroughly shellaced and baked. The coils are connected in series with the motor and are of sufficiently ample proportions to prevent excessive heating.

The hoisting mechanism consists of two motors and separate trains of gears driving three drums, one for hoisting and two for the opening and closing lines of the bucket. A view of this mechanism is given in Fig. 4. The opening and closing lines are operated at a greater speed than the hoisting line, which makes it possible to have all lines hoisting by the time the bucket is loaded and closed. Two sets of pinions and gears take the load on the drum, an arrangement which gives long life and an ample factor of safety. All of the gears in the hoisting mechanism are of high carbon cast-steel, machined and cut from the solid, while a special grade of alloy steel is employed for all of the pinions. All of the hoisting gears operating at high speed are inclosed in oil-tight hinged top gear cases. All of the shafting is of 0.3 to 0.4 per

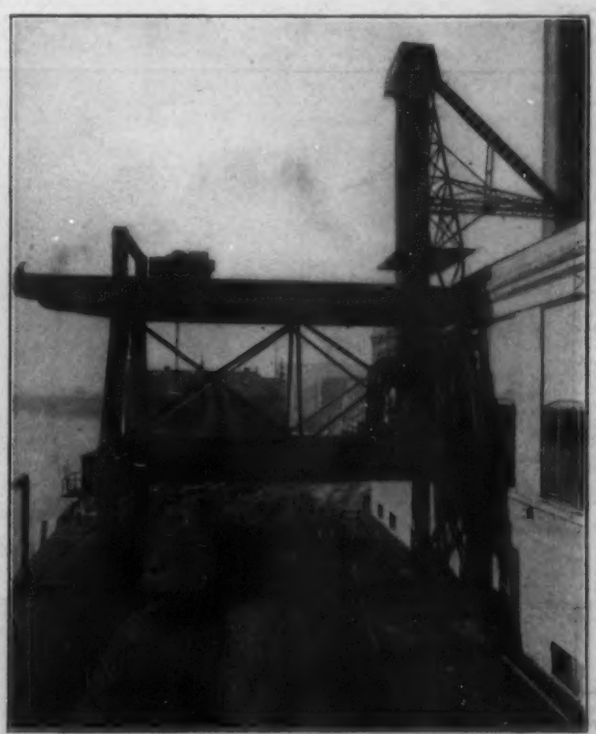

Fig. 1—A Special Coal-handling Crane Installed at the Power House of the Toledo Railway & Light Company by the Toledo Bridge & Crane Company, Toledo, Ohio.

cent. carbon machine steel accurately ground to size and designed to eliminate excessive deflection and to transmit full load torque at not more than a 9000-lb. fiber stress. The cast-iron drums have deep machine groovings for the rope and the combined bending and twisting stress is less than 1000 lb. per square inch. All of the bearings are equipped with split bronze bushings, which are of ample proportions and are held in place with one dowel so that the upper half may be used when the lower portion becomes worn. The shells may be removed without disturbing the shaft. All bearings are capped and standard through bolts are used in all cases, thus excluding studs and special types of bolts. In addition to compression grease cups, grease pockets are also provided for lubricating the bearings, which insure against heating should the operator neglect to fill the grease cups for a considerable length of time.

The operator's cage is located so as to give a clear view of the trolley and the other working parts and contains the controllers, the switchboard, the magnetic switches and the starting boxes, as well as providing sufficient room for the operator. A sub-platform is provided so

that access to the cage is easily made and from the cage to the footway, which extends the full length of the girder. A main line switch is located on the bridge at the footway and when the operator opens this switch in going out on the bridge to inspect the crane mechanism, all possibility of accidental starting is eliminated.

falling if they should become accidentally broken and all gears which might fall if they became loosened are held in place by a heavy taper pin driven between the gear hub and the end of the shaft. To brush obstructions from the track, guards are provided over the trolley wheels.

The elevator is of the continuous bucket type and the

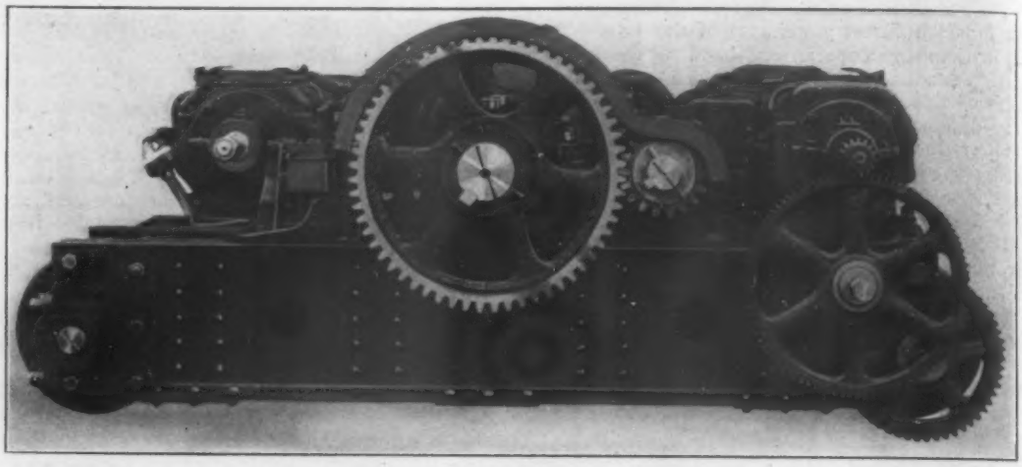

Fig. 2—An End View of the Trolley.

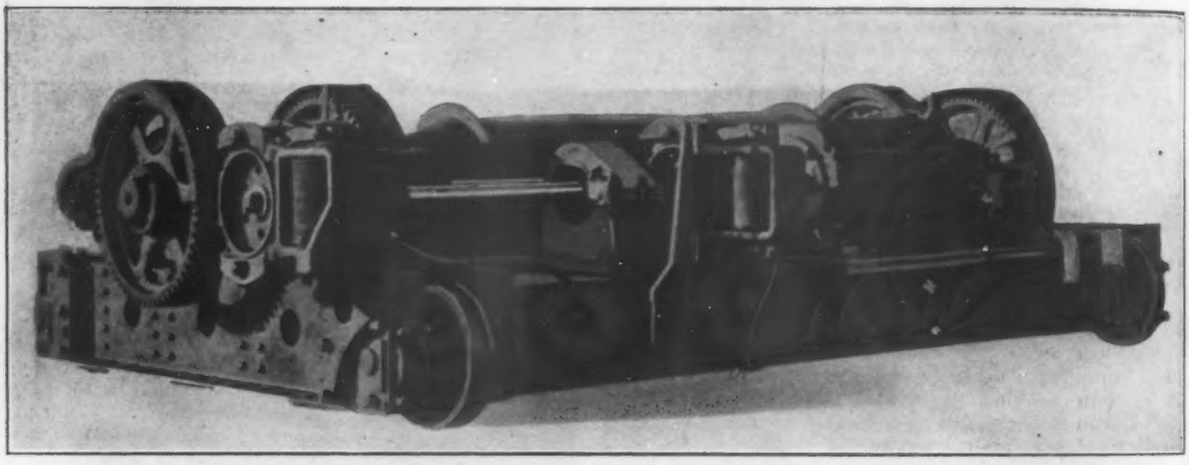

Fig. 3—View Showing the Electric Brakes.

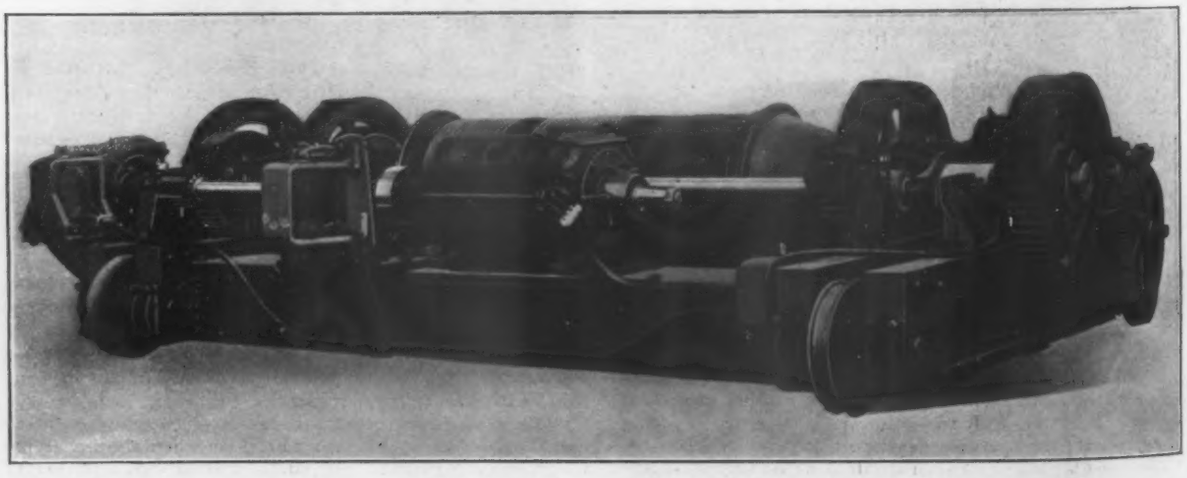

Fig. 4—View Showing the Hoisting Mechanism.
Three Views of the Trolley.

The design of the crane is such that any gear, shaft, motor frame, armature bearing or solenoid brake can be removed for inspection in the shortest time and at a minimum expense without disturbing any other part. No friction clutches are used and lever systems have been carefully eliminated in the design. Special care has been taken to avoid all chance of accident and with that end in view all couplings have been made of the flange type with no projecting bolts or nuts, while brake parts are prevented from

buckets, which were designed especially for this work, are carried by a double flange chain. The elevator leg is braced and supported by an A frame which also forms a support for the elevator motor, the driving mechanism and a platform for its inspection. The discharge spout on the elevator is raised or lowered from the platform on the crane girder.

The distance from the runway rail to the top of the elevator head is 100 ft., while that from the same point

to the top of the trolley rail is 54 ft. The distance between the centers of the truck wheels is 50 ft., and the length of the runway is 400 ft. The capacity of the crane as guaranteed by the builders was 75 to 100 tons of coal

Fig. 5—An End View of the Trucks Showing the Drive on Both Wheels Through Bevel and Spur Gears.

per hour, but in a test made 100 tons of coal was unloaded from the outside track and discharged into the storage bin in 40 min.

The General Refractories Company

Owing to the increase in the business of the General Refractories Company it has purchased the works of W. H. Wynn & Co., West Decatur, Clearfield County, Pa., and the Olive Hill Fire Brick Company, Olive Hill, Ky. In addition to these two works, the company owns the Sandy Ridge Fire Brick Company, Sandy Ridge, Pa., and the Blair Silica Brick Company, Sproul, Pa. It is also erecting a new clay brick works at E. K. Junction, Ky., and will shortly commence the erection of a new works near Philipsburg, Pa., giving in all a daily production of 300,000 brick. In addition to this it is manufacturing magnesite brick, chrome brick, and is a large importer of Austrian and Hungarian magnesite.

The company's principal offices are located at 802 Trinity Building, New York, and the officers are as follows: Wm. C. Sproul, president, Chester, Pa.; Wm. I. Schaffer, secretary and treasurer, Chester, Pa.; E. S. Hitchins, manager Olive Hill Fire Brick Company and the new works at E. K. Junction; J. H. France, manager Sandy Ridge Fire Brick Company and Blair Silica Brick Company; D. R. Wynn, manager W. H. Wynn & Co. and the new works to be erected near Philipsburg.

The selling department is as follows: E. A. McKelvy and R. A. MacDonald, Western district sales managers, with offices in the Olive Building, Pittsburgh, Pa.; Burrows Sloan & Co., Eastern district sales managers, with offices in the Real Estate Trust Building, Philadelphia, Pa.; W. A. Stanton, in charge of sales of magnesite, with offices in the Trinity Building, New York.

Another Italian Steel Combination.—Since the formation early in the year of a syndicate of the large iron and steel works in Italy, and the placing by native banks of a loan of $16,000,000 at the disposal of the combination, efforts have been made to constitute a second group, comprising the smaller undertakings in the iron and steel branches. This scheme, it is stated, has now been carried into effect, and all the products which do not emanate from the works of the Ilva Company, the Società Siderurgica Savona, the Società Alti Forni e Fonderia di Piombino, and the Società delle Ferriere Italiane, can only be sold to consumers through the Società Ferro e Acciaio Laminati, which has been formed for that purpose.

Sarah Furnace of the Kelly Nail & Iron Company, Ironton, Ohio, will probably be blown in this month after being idle for nearly two months.

The Wire and Horseshoe Pool Cases

On August 4, in the Circuit Court in New York City, United States District Attorney Wise asked that the indictment against Erskine Hewitt, vice-president of the Trenton Iron Company, be quashed as he had found that the indictment was a mistake. This was accordingly done by Judge Archbald. Quite a number of those indicted for participation in horseshoe and copper wire pools appeared to plead nolo contendere and were fined $1,000 on the first count and $100 on each succeeding count. There remain ten men who have not yet pleaded.

When the name of Edwin E. Jackson, Jr., the supervisor of the various pools, was called and after he had entered the usual plea, District Attorney Wise made a very strong argument for a prison sentence in his case. The prosecutor characterized Mr. Jackson as a man who was well aware that he was violating the law. He said Mr. Jackson as a lawyer and had violated the law for 20 years.

"He was not a manufacturer," said Mr. Wise. "He was not seeking a manufacturer's profit. He was seeking to earn millions. He went after the manufacturers and induced them to come into the pools." Mr. Wise ended his appeal by saying: "In my opinion this man is the worst type of criminal that society has to contend with. He was well versed in the Sherman law. He knew he was violating the law, and he dragged the others into it. This man could not have earned the great fortune he has in a legitimate law practice."

Mr. Jackson's counsel, De Lancey Nicoll, in reply, said he was surprised at the denunciation heaped on the head of the defendant by the Government prosecutor. He said Mr. Jackson was not in the country when the indictments were found, and had come back voluntarily. Admitting the existence of the illegal pools, Mr. Nicoll said that in every pool there must be an agent. His client, he said, only acted as an agent, for which he received a compensation.

Judge Archbald said it was not possible to present to determine the truth of the assertions of the United States District Attorney. But, he said, sufficient appeared from what had been stated in this case and in other cases before the court to show that but for the defendant the illegal compact might not have been carried out. Judge Archbald said he felt that he must make an exception in the case before him. He said, however, that he would eliminate the question of a prison sentence. He then announced that he would impose the maximum fine in Mr. Jackson's case, $5,000 on each of the nine indictments.

Papers on Fuel Oil

Exhaustive information on fuel oil is contained in the August issue of the Journal of the American Society of Mechanical Engineers. The following are some of the contributions: "Statistics of the Production of Petroleum on the Pacific Coast," by Arthur F. L. Bell, of the Associated Oil Company, San Francisco. "Comparative Evaporative Values of Coal and Oil," by C. F. Wieland, consulting engineer, San Francisco. "Light Oil Compared with Fuel Oil," by Joseph N. LeConte assistant professor of mechanical engineering at the University of California. "Furnace Arrangements for Fuel Oil," by C. R. Weymouth, of Charles C. Moore & Co., engineers, San Francisco. "The Atomization of Oil" by A. M. Hunt, consulting engineer, San Francisco. "Size of Stacks with Fuel Oil," by K. G. Dunn, vice-president of Hunt, Mirk & Co., San Francisco. "Locomotive Practice in the Use of Fuel Oils" by Howard Stillman, mechanical engineer, Southern Pacific Company, San Francisco. "Marine Use of Fuel Oil," by J. H. Hopps, consulting engineer, San Francisco. "Producer Gas from Crude Oil," by E. C. Jones, chief engineer of the gas department of the California Gas & Electric Corporation, San Francisco. The report also includes an extended discussion, both written and oral.

The American Steel Post Company, Los Angeles, Cal., has opened branch offices at 860 Monadnock Block, Chicago, and in the First National Bank Building, Denver, Col.

Acid and Basic Open-Hearth Steel

A Defense of the Quality of Basic Steel

BY WILLIAM HERBERT KEEN*

The paper of Prof. Henry Fay read before the June meeting of the American Society of Testing Materials, and published in *The Iron Age* of July 6, revives consideration of a subject which has often been discussed but never satisfactorily settled. A prominent metallurgist of this country in discussing this matter said: "Acid steel is much better for all engineering purposes. It is almost entirely free from slag and oxide and its physical properties are far ahead of basic open hearth; indeed, the acid is as much better than the basic steel as the basic is better than the Bessemer."

More Care Necessary in Acid Practice

Apparently this is the opinion of nearly every engineer. Some probably have good reason for thinking so, while others are very willing to believe it simply because it is a generally accepted fact. I say a generally accepted fact because it *is* a fact in ordinary commercial practice, and it is deplorable that all basic steel has to suffer the same criticism. If one-half the care were taken in making basic steel that is necessary in the acid practice these conditions would not be so obvious; in fact, I doubt if any marked difference could be shown to the advantage of either process. Each method has it weak points and each its points of advantage, and, if proper precautions are taken to reduce the former to a minimum and enhance the latter as much as possible, I venture to assert that basic steel will show just as good a test in the tensile machine as acid steel

In making acid steel the melter is obliged to use selected stock, while in the basic process anything is good enough. For some time the writer has had experience in melting selected stock on both acid and basic hearths of small capacity, and, so far as can be judged from the laboratory data as well as results of practical use, the basic steel thus produced is in every way the equal of acid steel; and, in fact, in comparing results on alloy steel, a slight balance of merit is found in favor of the basic metal. The tests show a greater toughness as measured by the elongation for any given tensile strength.

It is the object of this paper not to criticise Professor Fay in any way, but rather to advance an opinion on this subject backed up by actual experience with furnaces working under nearly ideal conditions, and to show the application of a formula which is of great assistance in classifying different steels by means of their physical tests.

First of all, let us consider the two methods of melting and note some of their points of superiority and inferiority:—

Factors Which May Lead to Inferiority

ACID.

1—High phosphorus.
2—High sulphur.
3—Oxide of iron, which on account of the slow reaction of the bath has to be added to hasten the removal of carbon and other elements.
4—Manganese burns out completely, so that sulphur has to be neutralized by the ferromanganese added at almost the last moment before tapping.
5.—Usually silicon is present to such an extent that not enough more can be added at the finish to have a good deoxidizing effect on the metal.

BASIC.

1—Occluded slag, which is very likely to be present in larger quantity than in acid steel.
2.—Oxide of iron, which has a greater tendency to form on account of the basicity of the slag, although partly eliminated by the manganese which is always present.

Factors Which May Lead to Superiority

ACID.

1.—Oxide of iron not as likely to form, but not necessarily absent.
2.—Small amount of slag necessary in the bath, and so probably very small amounts only are likely to go into the steel.

BASIC.

1.—Low phosphorus.
2.—Low sulphur.
3.—Manganese is always present in the bath and so has plenty of time to react with the sulphur and put it into a less harmful condition.
4.—Silicon burns out so that a large amount may be added in the ladle to act as a deoxidizer.

After considering the above factors, we notice that the most prominent advantages are the elimination of sulphur and phosphorus on the one hand and of oxides on the other. The harmful effect of the former has long been established without any question, but only a few papers have as yet been published about the latter, and the majority of these attribute causes of failure only to large isolated occlusions of slag or oxide and not to the sparsely scattered specks which appear in the microsection. Although it is perfectly reasonable and logical to assume a harmful effect of slag, especially when thus segregated, yet it is by no means certain that the small amount present in carefully melted material will seriously affect the quality of the steel. The writer is not aware of any quantitative results that give an idea of the amount of slag or oxide necessary to be present in order to result in failure. Of far greater importance, indeed, are the oxidized portions due to insufficiently cropped pipes of both acid and basic steel. In fact, judging from the standpoint of the chemical analysis, the basic steel has a great deal the better of it, while, judging from the micrograph, the acid has the advantage, although a very doubtful one in the case of alloy steel.

Many Tests Required to Reach a Definite Conclusion

Dr. Fay has armed himself against criticism by saying that his results should be considered as qualitative rather than quantitative. This is a good way to express it, for it certainly does require a great many tests in work of this sort to arrive at any definite conclusion. It must be admitted that, in general, his results show slightly in favor of acid steel, although in the tests of the material as received there is practically no difference in the merit of the two bars. It is the opinion of the writer that equally large differences would be obtained if tests of two different heats of acid steel—or in fact two heats of any one process—were to be compared in a similar way. It is to be regretted that so much careful work was done on samples which, judging from the physical results, were of such poor grade. A steel of 0.40 per cent carbon should give a merit figure of from 35 to 40. I would willingly guarantee a figure of merit of 34 on a basic steel of this analysis and would expect to get a figure of about 39. It seems, therefore, that these bars must have been very faulty to start with, and this being the case it is only fair to minimize the results they give.

In view of the fact that under presumably similar treatment several samples from one heat occasionally give discordant results, it is essential that a large number of tests be accumulated. Just as analyses of carbon steel are not always reliable on account of the great variation possible according to the location of the test, so also do physical tests vary even when taken from the same bar. We have on record, for instance, two tests taken from an inch round bar of mild steel less than 3 ft. long—purchased in the open market—which were pulled at the Bureau of Standards and showed a difference of 7,085 lbs. in their tensile strength. Assuming the contributory factors such as analysis and heat treatment to be identical, we still have to consider the possibility for differences due to forging temperature as well as number and force of blows of hammer and, probably most important of all, the finishing temperature. There is then the possibility that the bars used may have been annealed before shipment from the mill, in which case the temperature may have been higher than the majority of the tests quoted, which would account for the fact that no greater differences were noticeable in the subsequent annealings.

The Question Cannot Be Decided by Tensile Test Alone

Judging from the results tabulated as well as a great many others of similar character, the writer feels compelled to admit that, if given two bars of identical com-

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position made with equal care, one of basic and the other of acid steel, he would be at considerable loss to identify them. Certainly, as yet, there is not enough data at hand to decide such a question by means of the tensile machine alone, and yet this machine is the standard by which the buyer purchases his material.

There is still considerable disagreement as to the method of judging the merit of steel even after the tensile properties are known. By means of an empirical formula worked out from a large accumulation of results by A. G. McKenna of our company, it is possible to compute a figure of merit which is an excellent guide in thus judging the true quality of samples pulled in a testing machine. of merit figures, as follows:—

$$M = \frac{T\ (E + 20)}{100{,}000}$$

In which M = Figure of merit
T = tensile strength in lbs. per sq. in.
E = percentage elongation

In order to get a better idea of the tests made by Dr. Fay, I have rearranged the results and added a column of merit figures, as follows:

	Acid.			*Basic.*		
Test.	Tensile strength.	Elongation.	Merit.	Tensile strength.	Elongation.	Merit.
As received.....	85,400	20.3	34.4	73,500	25.0	33.1
(1) 700°.....	78,300	21.2	32.2	72,600	22.6	30.9
(1) 750°.....	77,500	22.2	32.7	70,300	21.5	29.2
(1) 800°.....	79,800	18.8	31.0	73,500	18.8	28.5
(1) 900°.....	81,700	20.4	33.0	74,200	24.2	32.8
(1) 1000°.....	81,700	18.8	31.7	73,000	25.0	32.9
(2) 700°.....	75,100	21.1	30.9	67,800	27.0	31.9
(2) 750°.....	75,700	14.5	26.1	68,200	14.0	23.2
(2) 800°.....	79,700	22.3	33.7	68,300	22.3	28.9
(2) 900°.....	77,200	21.2	31.8	68,100	20.8	27.8
(2) 1000°.....	79,700	20.8	32.5	68,900	20.4	27.8
(3) 700°.....	67,000	14.8	23.3	70,800	18.7	27.44
(3) 750°.....	80,100	21.0	32.8	66,900	23.4	29.0
(3) 800°.....	80,200	21.8	33.5	72,200	22.7	30.8
(3) 900°.....	73,500	21.8	30.7	65,700	28.9	32.1
(3) 1000°.....	73,100	22.6	31.1	68,100	25.7	31.1
(4) 700°.....	77,030	14.0	26.2	66,670	24.2	29.5
(4) 750°.....	74,680	23.4	32.4	67,400	25.0	30.3
(4) 800°.....	71,300	25.0	32.1	63,600	26.5	29.6
(4) 900°.....	72,500	23.4	31.5	72,300	22.6	30.8
(4) 1000°.....	71,200	22.2	30.0	64,600	21.3	26.7
Average.....	76,781	20.5	31.1	69,365	22.9	29.8

The fact that one steel has a lower tensile strength than another is nothing to its discredit, provided it has a compensatingly greater elongation. Take, for instance, the two tests of the steel as received from the mill. There is a considerable difference in the components of the tests, and yet as shown by the figures of merit, 33.1 and 34.4, the bars are practically of equal quality. They are as nearly alike at least as two tests from different parts of a single bar are likely to come. The averages of the results show a greater elongation for the basic steel than for the acid steel. In view of this it is hard to imagine the basic steel as having a greater number of flaws. It is interesting to note the very slight difference existing between the highest and the lowest figures of the series exclusive of the original bars:—

Test.	Tensile strength.	Elastic limit.	Elongation.	Merit.
Highest A (800°).....	80,200	37,500	21.8	33.5
Highest B (1000°).....	73,000	36,000	25.0	32.9
Lowest A (700°).....	67,000	33,500	14.8	23.3
Lowest B (750°).....	68,200	33,400	14.0	23.2

It is suggested that a stiffening treatment of these bars by quenching in water from some uniform temperature, followed by varied temperings, would lead to an interesting set of results. The tensile tests would undoubtedly show greater consistency according to the varying temperatures and the investigator would have the assurance that whatever treatment they had received at the mill, barring of course an overheated condition, it would not interfere with his final heatings.

Results of Heat Treatment

It is of course a recognized fact that it is always possible by means of heat treatment to reduce the elongation, to the simultaneous improvement of the tensile strength and elastic limit, and vice versa. The chief value of this merit formula is in estimating within about what limits it is possible to vary these conditions on any one steel. It also shows the relation between two bars as above illustrated, irrespective of differences in strain and stress. This is very strikingly demonstrated in a table of tests* given by Professor Howe, in which he shows the usual upper and lower tensile strength for any given elongation: —

Elongation.	Highest tensile strength.	Merit.	Lowest tensile strength.	Merit.
4.....	150,000	36.0	110,000	26.4
6.....	138,000	35.9	102,000	26.5
8.....	130,000	36.4	94,000	26.3
10.....	122,000	36.6	85,000	25.5
12.....	115,000	36.8	80,000	25.6
14.....	109,000	36.7	75,000	25.5
16.....	102,000	36.7	70,000	25.2
18.....	98,000	37.2	64,000	24.3
20.....	93,000	37.2	59,000	23.6
22.....	88,000	37.0	56,000	23.5
24.....	80,000	35.2	52,000	22.9
26.....	77,000	35.4	51,000	23.4
28.....	74,000	35.5	51,000	24.4
30.....	71,000	35.5	50,000	25.0
32.....	70,000	36.4	50,000	26.0

Judging from the uniformity of the merit figures, it is quite possible that all of the conditions of the first column, for instance, with the exception perhaps of the last two or three, could be attained in one piece of steel.

By thus estimating the range attainable, advantage is taken in determining the possibility of meeting a specification with any given steel of which the tensile properties are already known. If one were required to furnish a steel of not less than 80,000 lbs. per sq. in. tensile strength and not less than 20 per cent elongation, and his steel in hand gave 50,000 lbs. and 30 per cent, he would compute the figure of merit for the former as 32.0 and the latter as 25.0, and would know at once that it is probably impossible for him to treat this particular piece of steel to meet the required conditions. On the other hand if he had a piece which gave 130,000 and 10 per cent., which would mean a figure of 39.0, he would know that he could easily meet the specifications. So he could also with a steel of 30 per cent elongation and 65,000 tensile strength, which would give a figure of 32.5, which is larger than the required figure of 32.0. It does not necessarily have to be a larger figure, as I have known cases where a figure three points lower had been brought up to the required value, and even a greater improvement is possible if the steel has not been normalized. The merit figure, like all analytical results, has to be used intelligently, and it must be remembered always that in processes of heat treatment there is the added feature in one's favor that the subsequent heatings of steel frequently improve conditions on account of better refinement of the grain.

There are of course other formulæ which will accomplish a similar comparison, but they do not cover the conditions of a very wide range of elongation and are not of such uniformly general application. Take, for instance, the formula most commonly in use in England, as follows:—

M = T + E
M = Merit
T = Tensile strength in gross tons
E = Elongation in per cent.

A steel of good quality will add up to about 65. Note the variation which exists when wide limits of elongation are under observation, as shown by the figures obtained from the first column of Professor Howe's table: 71.0, 67.6, 66.0, 64.5, 63.3, 62.7, 61.5, 61.8, 61.5, 61.3, 59.7, 60.4, 61.0, 61.7, 63.3.

I have laid the emphasis on the tensile strength and elongation throughout this paper because as yet there is no very exact way of correlating the other two factors with practical conditions. In general, it may be noticed that for carbon steel the percentage reduction of area is about twice the elongation, while the tendency with alloy steel is to increase this ratio to nearly three times. It is also quite noticeable that various conditions of manufacture influence this particular quality. Generally a forged bar gives a much greater reduction of area than a casting, and there is a slight suggestion that this property is increased according to the amount of work done by the forge. It also becomes greater as the refinement of the grain improves by heat treatment Overheating reduces it to almost nil.

The elastic limit, while probably a very important factor in materials subject to vibration, seems to be no great assistance in determining quality. It varies a good deal with different heat treatments. It is possible to increase it materially by water annealing, whereas an annealing heat followed by a slow cooling almost invariably reduces it markedly. It is of course greatly increased by hardening processes. The addition of nickel to steel also results

*Howe's Metallurgy of Steel Ed. of 1895, p. 17.

in raising the elastic limit. It will be seen, therefore, that when necessary to attain a definite value for this factor it may be readily accomplished by suitable methods of treatment.

Summary

1. The prevailing opinion is that acid steel is superior to basic, but the writer believes that basic steel is not inferior to acid when equal care is used in the melting.

2. A variation of 7,000 lb. in tensile strength is quite possible in two tests from the same bar as received from the mill.

3. Differences in Dr. Fay's results are not enough to warrant conclusions.

4. Knowledge of testing materials at the present time is insufficient to definitely distinguish acid steel from basic when of identical analysis.

5. An empirical formula worked out by A. G. McKenna is of value in judging the merit of steel by means of the physical results and allows predictions as to limits which can be attained in elongation and tensile strength.

Nickel Steel

Some Properties of Heat-Treated Three Per Cent.

A paper was presented at the recent meeting of the Iron and Steel Institute by Prof. A. McWilliam and E. J. Barnes, of Sheffield, on heat-treated 3 per cent. nickel steel which is abstracted as follows:

The steels worked upon were made in a coke-fired crucible furnace, and poured into ingots 3 in. square. They were forged to 1 in. diameter round bars. The analyses are given in Table I, from which it may be seen that they were of great purity.

Table I.—Analyses.

No.	Carbon.	Nickel.	Manganese.
1239	0.06	3.05	0.11
1255	0.12	2.93	0.13
1253	0.28	2.90	0.15
1256	0.30	3.15	0.13
1254	0.47	2.92	0.14
1252	0.67	2.96	0.19
1251	0.74	2.98	0.19
1261	0.91	3.10	0.17

The carbons were carefully determined by combustion. The silicon in all the steels was under 0.10 per cent.; the sulphur was practically constant at 0.03, and the phosphorus at 0.02.

The tensile and alternating stress tests of the steel, as forged, were made under Professor Arnold's standard conditions, and on his machine, and are given in Table II.

Table II.—Physical Tests, Forged.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area. %	Alternations.
1239	0.06	3.05	51,520	66,976	35.0	70.6	189
1255	0.12	2.93	47,040	69,216	34.0	65.8	259
1253	0.28	2.90	51,520	79,744	29.0	57.7	300
1256	0.30	3.15	51,520	80,640	28.0	54.6	301
1254	0.46	2.92	56,000	95,424	22.0	44.6	267
1252	0.67	2.96	60,480	115,360	19.0	36.7	248
1251	0.74	2.98	76,160	129,696	14.0	25.2	218
1261	0.91	3.10	78,400	149,632	8.5	22.1	188

The yield points were determined with the assistance of a Metzger extensometer.

In Table III are given the results after "normalizing." This treatment consisted in placing the bars in a gas muffle at about 700 deg., slowly raising to 900 deg., in about three-quarters of an hour, and holding at this temperature for half an hour. The bars were then taken out, reared on end on fire-bricks, and cooled in air.

Table III.—Physical Tests, Normalized.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area. %	Alternations.
1239	0.06	3.05	47,040	66,528	38.0	72.5	321
1255	0.12	2.93	47,488	67,424	36.5	68.4	319
1253	0.28	2.90	51,520	78,400	31.0	59.1	411
1256	0.30	3.15	50,176	80,640	30.0	55.6	249
1254	0.46	2.92	55,552	92,960	23.0	45.9	278
1252	0.67	2.96	64,960	113,568	19.0	37.2	209
1251	0.74	2.98	69,440	132,608	16.0	44.3	204
1261	0.91	3.10	76,160	149,184	12.0	22.7	149

In Table IV are given the results obtained after a very drastic annealing. The bars were placed in a coal-fired reverberatory furnace, slowly heated up to 950 deg. C, kept at this temperature for about 20 hours, and very slowly cooled down in the furnace. Under this treatment considerable free or graphite carbon was precipitated in some of the steels as shown in the table.

Table IV.—Physical Tests, Annealed.

No.	Total Carbon.	Free Carbon	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	....	3.05	41,216	60,032	39.0	71.7
1255	0.12	....	2.93	42,112	62,048	37.0	66.2
1253	0.28	....	2.90	47,488	68,096	31.5	58.2
1256	0.30	0.03	3.15	37,632	67,200	30.0	54.6
1254	0.46	0.07	2.92	43,008	71,904	28.0	48.7
1252	0.67	0.30	2.96	47,488	70,336	20.0	46.0
1251	0.74	0.70	2.98	36,736	56,000	29.5	46.0
1261	0.91	not det.	3.10	32,256	52,864	17.0	21.8

The results given in Tables V, VI and VII are those after quenching from 850 deg. C and tempering at 400, 500 and 650 deg., respectively. The rather high quenching temperature was chosen because it was above the change points in the lowest carbon steel. The location of the change points, on both heating and cooling, are given in a succeeding table. The bars were heated for quenching in a Brayshaw, gas-fired, salt-bath furnace, the temperature of which was checked by two pyrometers. The pieces were put into it when it was at 830 deg. C. The temperature was raised to 850 deg., and held there for 15 min., when the pieces were rapidly withdrawn and quenched in a large tank of water at from 16 to 20 deg. The tempering was done in another Brayshaw lead-bath furnace. The pieces were held for 15 min. at the required temperature, removed, and cooled in air.

Table V.—Physical Tests, Quenched 850 Deg. C, Tempered 400 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	59,136	74,144	37.0	78.4
1255	0.12	2.93	62,720	80,192	34.0	77.4
1253	0.28	2.90	82,432	104,384	27.0	67.4
1256	0.30	3.15	86,016	112,000	24.0	63.5
1254	0.47	2.92	109,312	149,184	18.0	54.6
1252	0.67	2.96	177,856	203,392	13.0	45.1
1251	0.74	2.98	208,768	216,832	10.0	30.3
1261	0.91	3.10	210,560	236,768	8.0	17.6

Table VI.—Physical Tests, Quenched 850 Deg. C, Tempered 500 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	51,968	71,008	37.5	76.8
1255	0.12	2.93	56,000	77,056	33.5	76.4
1253	0.28	2.90	77,056	100,800	28.5	68.6
1256	0.30	3.15	80,640	112,896	24.0	58.4
1254	0.47	2.92	94,976	135,296	19.0	53.7
1252	0.67	2.96	132,160	167,552	14.5	39.7
1251	0.74	2.98	154,560	184,576	12.0	32.9
1261	0.91	3.10	164,864	199,136	12.0	30.0

Table VII.—Physical Tests, Quenched 850 Deg. C, Tempered 650 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	51,968	69,664	37.0	77.9
1255	0.12	2.93	51,520	73,696	36.0	76.4
1253	0.28	2.90	63,616	86,464	33.0	70.8
1256	0.30	3.15	65,408	90,048	27.5	63.9
1254	0.47	2.92	75,264	105,280	26.0	58.2
1252	0.67	2.96	91,840	117,376	21.0	49.0
1251	0.74	2.98	103,936	125,888	18.5	43.5
1261	0.91	3.10	105,280	130,368	17.0	39.2

In the original paper the details of the heating and cooling curves are plotted. They are tabulated in Table VIII.

Table VIII.—Change Points in Degrees Centigrade.

	Heating			Cooling		
No.	Ac 1	Ac 2	Ac 3	Ar 1	Ar 2	Ar 3
1239	692	746	796	620	661	728
1255	695	729	....	625	656	718
1253	701	....	....	631	663	694
1256	700	....	....	629	649	676
1254	703	....	....	635	654	....
1252	704	....	....	637	....	....
1251	706	....	....	631	....	....
1261	705	....	....	626	....	....

The paper also gives details of the microstructure of longitudinal sections from the bars, and is illustrated with typical micro-photographs.

The Colonial Iron Company, Riddlesburg, Pa., will have its new furnace ready for blast in November. It will be 75 x 18 ft. and will be equipped with three 75 x 18 ft. McClure stoves. The two alternate stacks have been dismantled.

A Grinder for Planer Cutters

An Attachment Recently Developed by the Newton Machine Tool Works

The inconvenience of grinding facing cutters having inserted teeth has been more pronounced in the case of those used by the rotary planing machine than in any other type. The factors which have brought this about are the large diameter of the cutters, the heavy strains to which they are subjected at times and the flexibility of the structural shapes which are frequently handled by these machines. It is of course possible to remove the cutters and shape them in the standard type of grinding machine, but a considerable amount of time is consumed in removing and replacing them and there is the inconvenience of setting the tools to the proper hight; if the slots in the head are not exactly duplicated, some of the cutters will do more than their proportionate share of the work. With a view of eliminating this loss of time and the corresponding expense the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., designed a rotary grinder, which after two or three years' experience, has been redesigned and perfected to meet the operating conditions existing at the present time. Fig. 1 illustrates the teeth of a rotary planer cutter being sharpened by the most recent attachment brought out by this company, while a view of the attachment itself showing operating details is given in Fig. 2

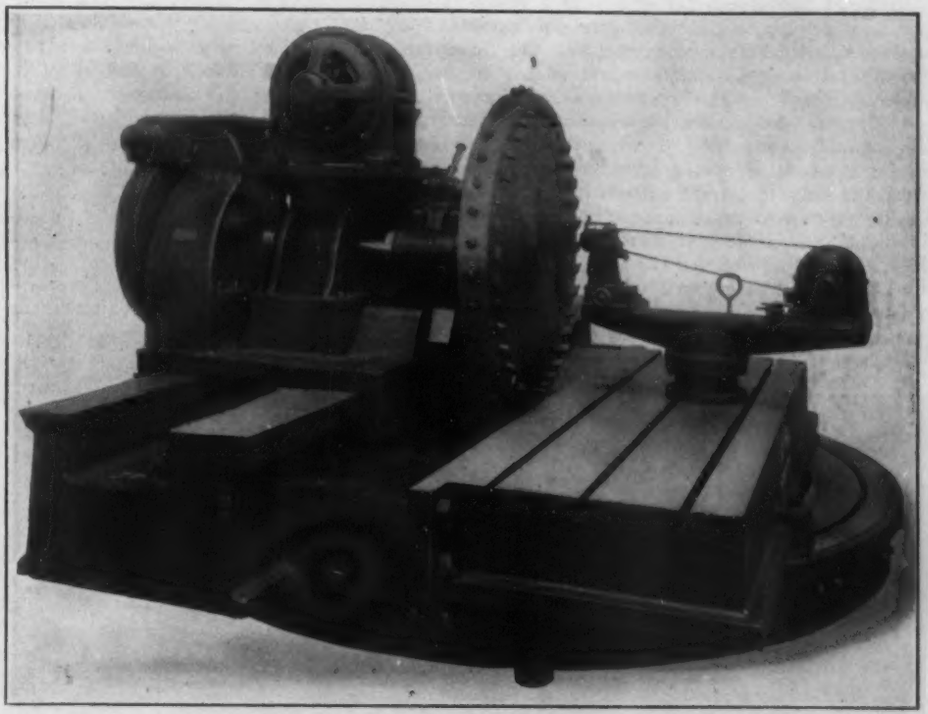


Fig. 1.—The Teeth of a Rotary Planer Cutter Being Ground by the New Grinding Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

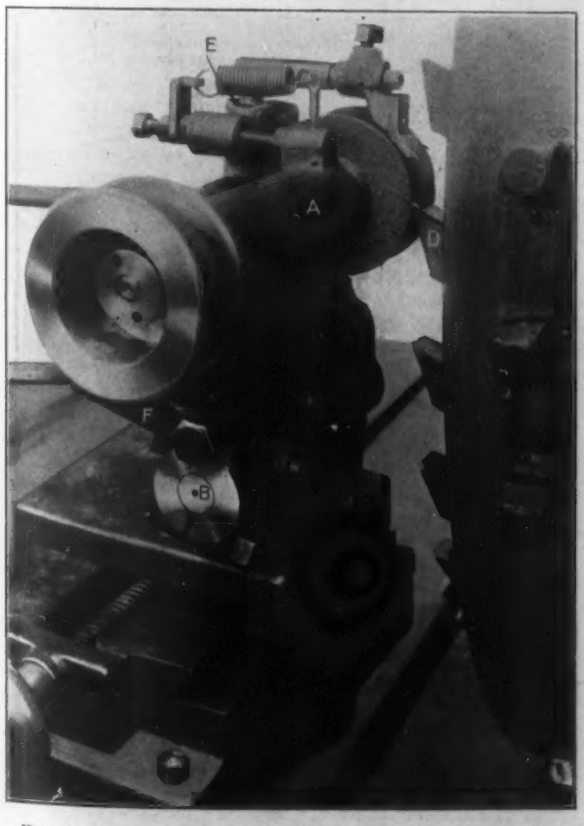


Fig. 2.—View of the Grinding Attachment Showing Details.

The attachment consists of an arm, A, Fig 2, which is pivoted at B and carries the grinding wheel spindle. An oscillating movement is imparted to this arm by the finger C engaging the tools D in succession while the head is rotating. This finger is attached to the arm E on which is fitted a crank plate controlling the length of the movement of the spindle arm A. The finger C is raised as the tool rotates and the arm A is in turn forced under the tool, which gives the clearance angle while the other arm F is engaged to finish the side of the tool. The engagement of this second arm causes the partial rotation of the shaft B which has a helical spiral slot milled in it and a pin in the arm A that engages in this spiral slot imparts the side motion to that arm. The operation of the finger C also gives a side motion and at this time the mechanism for driving the front clearance is disengaged. A side adjustment is provided for the saddle to locate the emery wheel properly and the whole grinding attachment is mounted on a support as shown in Fig. 1.

The attachment is driven by a ½-hp. motor at a speed of approximately 2500 r.p.m. The grinding wheel must of course have the proper shape to give the necessary contour to the tools. If desired, the attachment can be furnished for any style or shape of machine, the only dimension required being the distance from the center of the cutter head to the top of the surface upon which the attachment is to be mounted. The circular sub-base supporting the attachment can be furnished in a variety of hights to accommodate the conditions existing on the different machines. In a test of one of these attachments recently made on a vertical machine it was found that cutters ground in this way and having their hight accurately duplicated and the contour exactly reproduced allowed a feed twice as fast as the ordinary rate employed and gave an exceptionally smooth finish.

A patent on a variable speed gearing has been assigned to the W. F. & John Barnes Company, Rockford, Ill., by John S. Barnes, Rockford, who was granted a patent on July 18, No. 998,227. It appears to cover a construction involving an intermediate shaft between driving and driven shaft with a number of different diameter gears on an intermediate shaft, any one of which may be made to mesh into gears on either the driven shaft or the driving shaft.

The Knight Gasoline Engine

A New Motor Combining Great Power, Flexibility and Silence

In addition to the standard poppet valve motor regularly manufactured, the Columbia Motor Car Company, Hartford, Conn., will bring out next year a new high-powered car in which the Knight sliding sleeve valve gas engine will be used. This motor combines the three essential features of power, flexibility and silence in one motor which is simple in construction. This simplicity of construction is what makes the engine silent running, since approximately one-third of the parts ordinarily employed in gas engine construction have been eliminated, and these were the ones that wore earliest and most and combined in the process to make noise. This motor will be made in the Columbia plant at Hartford, Conn., although castings of Swedish iron for the cylinders, sleeve valves, pistons, rings and other parts will be obtained abroad. Fig. 1 is a view of the motor showing the reciprocating sleeve valves and the simplicity of parts, while a cross sectional elevation of the engine is given in Fig. 2.

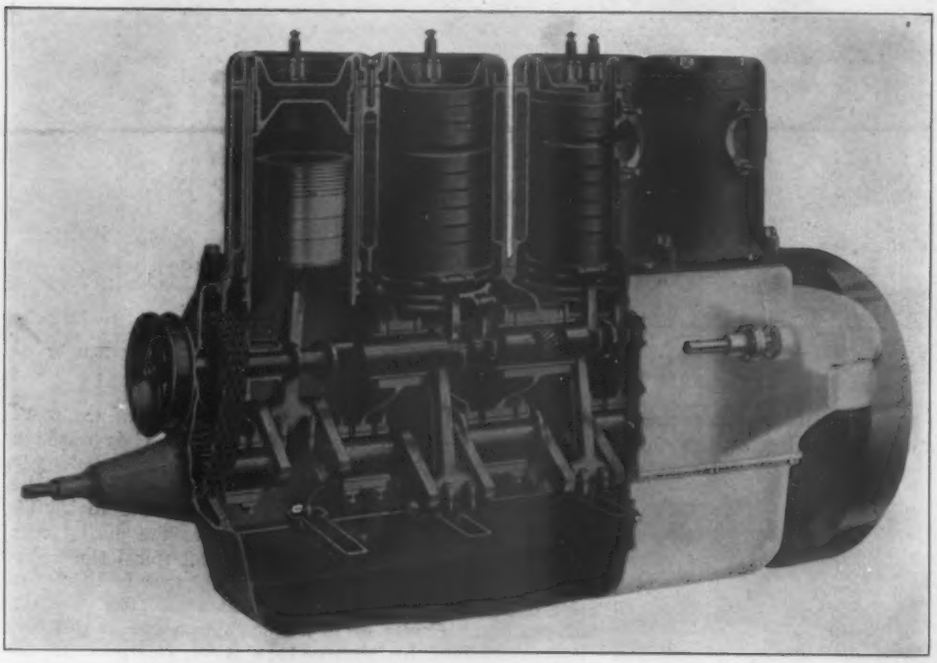


Fig. 1.—The New Columbia Knight Gasoline Engine for Automobiles, Built by the Columbia Motor Car Company, Hartford, Conn.

The engine is of the four-cycle type with the cylinders cast in pairs, the dimensions being 4⅞ x 5⅛ in. Although rated according to the A.L.A.M. standard at 38 hp., the power developed by the motor is said to be 70 hp. without motor racing, while a maximum of 85 hp. can be secured. The cylinder heads, which are gas tight, are bolted on and are depressed and contain two spark plugs for the Bosch dual ignition system. A water jacket encircles all the cylinders and the cylinder heads and the circulation areas inclose the spark plugs and the gas ways so that a uniform heat is maintained throughout the entire length of the piston travel. The sleeves, of which there are two for each cylinder, form the valves and are reciprocated to perform the valve functions by short connecting rods attached to a miniature crank shaft which is driven from the main shaft at half speed by a Coventry silent chain. There are no tappet or mushroom valves, no cam shafts or cam rollers, push rods or trains of enmeshed driving gears in front.

Directly inside the cylinder wall is an endless sleeve having openings on each side. These are in the form of wide slots and are located close to the top of the sleeves. A second endless sleeve is situated inside the first one and has slots on both sides. On the suction stroke of the motor the slots on the right side of these sleeves register perfectly, thus exposing a large opening through which fresh gas may enter just as it would through the aperture of the lift of a mushroom type valve. At the commencement of the compression stroke these sleeves slide, one up and the other down, so that the slots are no longer in register and no way is afforded for the gas which has been drawn in to escape. When the compression of the charge has been accomplished and the piston has risen to the top of the cylinder the charge is ignited and the explosion or power stroke takes place. The piston now being at the bottom of the firing stroke the left-hand slots of the sleeves register, thus providing a large exhaust port through which the spent gases escape. The advantages claimed for this valve mechanism are that the inlet and exhaust openings are twice the size of the gas passages allowed in the most liberally designed tappet type motors and almost three times the size of the passages in motors equipped with the L type valves. The opening and closing of the valves is timed perfectly not only at low speeds, where no difficulty is ordinarily experienced in a cam roller following the cam in a tappet type motor, but also at very high motor speeds. As the timing is mechanical it is claimed that it cannot become deranged through ignorance, neglect or wear.

The design of the motor is such that there are no offset pockets and the minimum cubical contents for the compression chamber is secured. The crank shaft, which is of large diameter, is bored hollow and is so designed that the lubricant travels to the bearings when caught. The valve shaft is cut from the solid and has throws for the connecting rods actuating the sleeves. These rods are forged and the cylinders, the sleeves and the pistons are of imported cast iron machined and ground. Cast aluminum is employed for the two crank cases and the entire motor is supported by four legs.

The lubricating system is interesting and is of the builder's movable dam system. In this system there are four troughs located transversely with reference to the filtering screen of the lower crank case which are hinged on a bus shaft and connected to the throttle. These troughs are automatically raised and lowered with the opening and the closing of the throttle. When the throttle is opened and the troughs are raised the connecting rod scoops dip into the troughs which contain a greater amount of oil before overflowing. When the load on the engine is light the closed throttle lowers the hight of the troughs so that they overflow more quickly and the scoops dip lightly into them and a correspondingly smaller amount of oil is splashed. This oil first falls to the screen and is drained to the reservoir below to be again pumped into the troughs by the plunger pump. The system is thus a combination of force feed oiling and the splash system. In poppet valve engines it has been the common practice to set the oil regulation at a point to meet the most exacting demands of hard hill climbing and continued high speed road work. This results in a considerable waste of lubricant due to the fact that cars are only infrequently called upon to engage in this exceptionally hard work. One of the special features claimed for this system is that it supplies the lubricant in just the proper amount for the work the car is performing and does so automatically. Some idea of the efficiency of the system can be gained from the statement that tests showing an average run of 750 miles for a single gallon of lubricating oil have been made and in one case a mileage as high as 1200 has been secured with this quantity of lubricant. A sight feed indicator upon the dash and a ball topped shaft mounted upon a bob cork float set outside the crankcase give accurate information regarding the amount of oil in the

reservoir and the rate at which the engine is being lubricated.

The drive for the magneto and the oil pump is through a silent chain to the fly wheel end of the motor, while the valve shaft is driven in the same way from the forward end. Individual entrance ways for each cylinder are provided for the exhaust manifold, while the inlet manifold has two main leads to each pair of cylinders, the cylinder port being two-way branched internally to provide entrance for the gas to each cylinder. The ignition system is the Bosch double outfit with two sets of plugs, a pair

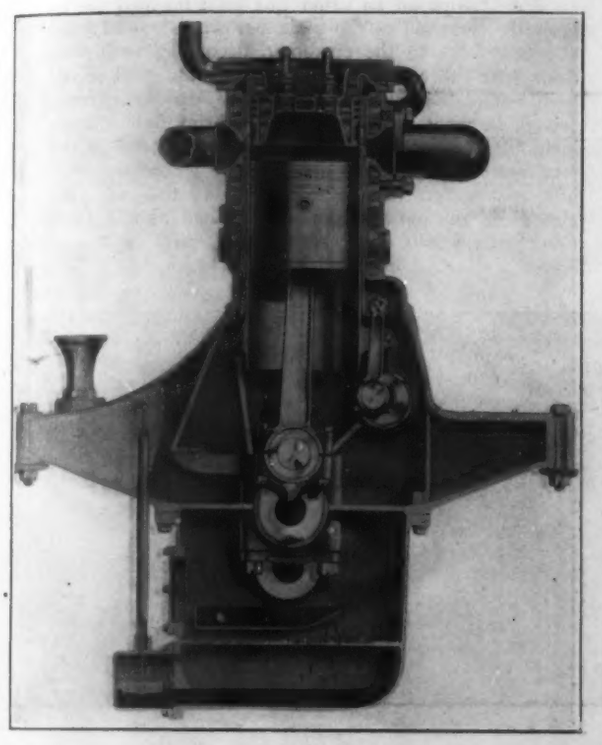


Fig. 2.—Cross Sectional Elevation of the Engine.

being threaded into the head of each cylinder directly over the piston and completely surrounded by the water jacket. The water passages are of large area, the piping is simple while the cooler is of the cellular type. The clutch is of the leather faced cone pattern.

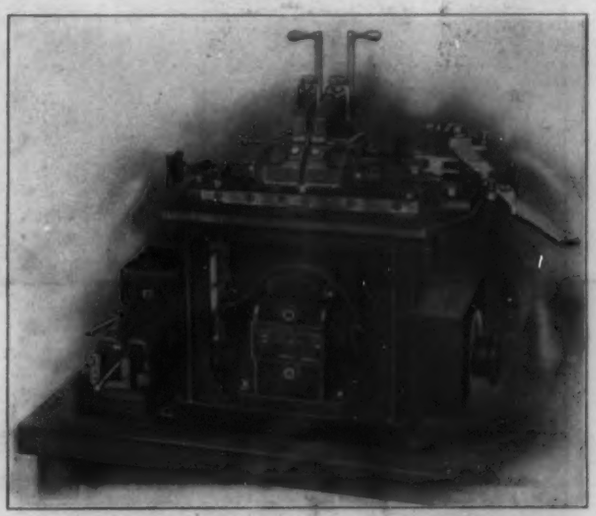
The feature of quietness in operation is secured from the fact that there are no tappet noises and there is no click of falling valves on their seats as well as no gear noise incident to the push and the pull exerted against the whole train of front engine gears. The great power which the motor is able to develop permits it to accelrate rapidly and gives the advantage of flexibility. One of the remarkable features of the motor is that its power increases with use. In a test one of these motors was run under brake load on a bench for 132 hr., afterward placed in a car and run 500 miles a day for four days at an average speed of 40 miles per hour and again placed on the bench for 7 hr. continuous running. The average horse-power developed in the first bench test was 54.3, while that of the latter test was 57.25, thus proving that the power of the motor increased with use.

New Thomson Electric Welder

Ability to make all classes of welds from typewriter bars and small sizes of wire to large links, rings and buckles is claimed by the Thomson Electric Welding Company, Lynn, Mass., for its new butt electric welder. This machine was built to meet the demand for a welder combining strength and durability with accurate and rapid operation. The machine operates on the same principle as the others built by this company and employs heavy currents of electricity at low voltages which are passed through the abutting ends of the pieces of metal to be welded. The passage of this current results in the generation of local heat at the point of contact, while at the same time pressure is applied to force the parts together.

The welder, which is known as the 2-A-1911 model, unites in one machine the essential features of a perfect electric welding machine in addition to improvements that make it suitable for a very wide range of work. In constructing the machine an effort was made to have it as complete as possible in itself and it therefore has a self-contained regulator which enables the current to be controlled perfectly from a maximum to a minimum for the different sizes of work and also includes a self-contained switch which automatically breaks the circuit when the weld is made. As far as possible all the moving parts are constructed to reduce the wear to a minimum, while adjustments have been provided to take up any wear that may occur. The pressure which is applied to complete the weld is exerted almost in a direct line with the work, an arrangement which tends to secure very accurate work, while its amount can be readily adjusted to suit the heaviest or the most delicate work. Although the machine is primarily semi-automatic in operation, it can easily be changed to a hand-operated machine and used as such. The welder is designed as a bench machine, but can be readily placed upon a truck and moved about as a portable welder, the current which operates it being supplied by two wires run to the nearest electric outlet.

The electrical features of the machine have also received consideration in its design and high electrical efficiency is secured by clamping the work directly on the terminals of the transformer, thus doing away with the loss of energy that occurs when long leads connecting the transformer



A New Type of Electric Welding Machine Built by the Thomson Electric Welding Company, Lynn, Mass.

and the work-holding device are used. Another electrical feature of the welder is the use of an individual fuse mounted upon the machine. This does away with the need for a special fuse in the supply mains and eliminates all possibility of interference with the main circuit. The transformer furnished with the welder has a capacity of 3 kw. and can be operated upon an alternating current circuit having a frequency of from 40 to 60 cycles. The primary coil is wound to suit any voltage of from 100 to 440. The transformer is open to the air and in this way thorough ventilation is secured and the conduction of any heat from the work in the work holders to the transformer is prevented. If desired a special attachment can be furnished with the machine which enables hard steel wire to be annealed after welding without necessitating the reclamping of the piece in the work holders.

It is possible to handle steel stock ranging from No. 16 wire up to 5/16-in. rounds and from 1/8 to 3/16 in. copper wire. The time of heating and welding the work varies from ½ to 2½ sec., depending upon the size and the character of the work. The output of the machine per 10-hr. day is from 2500 to 3000 welds according to the skill of the operator, the amount of the current consumed being between 5 and 6 kw.-hr., or 2 kw.-hr. per 1000 welds. Although the maximum size of stock ordinarily handled is 5/16-in. rounds the machine has successfully welded ½-in. round stock in 9 sec. This, however, was a considerable overload on the machine and stock as large as this should not be handled ordinarily except for intermittent work.

Pattern Handling in a Steel Foundry

The Importance of System in this Work

BY C. A. TUPPER, MILWAUKEE, WIS.

In connection with the works of the Falk Company, Milwaukee, Wis., there has been evolved a system of pattern storage and handling which is unusually well planned and complete for a jobbing steel foundry. All patterns, as received from customers, are carefully numbered and deposited in a steel-frame concrete building, well arranged, with shelves and partitions, the largest patterns being suitably grouped in sectional compartments at one side of the building, the medium sizes placed in open bins on the other side and the smallest ones set on shelves above them. A good idea of the general arrangement may be gained from the accompanying illustration, which also shows the brick and concrete walls, columns and ceilings, cement floor and fireproof doors dividing the building into compartments, any one of which can be immediately isolated in case of a blaze. A closely regulated heating system maintains an even temperature in winter, and the open, spacious construction insures good ventilation during the hot summer weather, thus keeping the patterns in excellent condition. The system of numbering, which can be plainly seen from the illustration, as, for example, 1-8 B 9-10—the index letter being on a dividing center—renders it very easy to find patterns as needed. A record of each is kept on a separate file card for ready reference, and in the office it can be ascertained at once just where a pattern is to be found, whether in storage or in service.

View in the Pattern Storage Building of the Falk Company, Milwaukee, Wis.

The method of keeping track of the work is such that orders can be put through in the quickest possible time. This will be clear from the following: As the instructions come in from customers each day they are written out at the office in quadruplicate. Two copies go to the shipping department, one being kept on file there and the other returned to the office when the order has been completed and shipped. The third copy is sent to the pattern storage department and the fourth is kept on a card record at the main office. From the order received at the pattern storage building a molder's ticket is made out, and this accompanies the pattern to the foundry, rush work being noted on a slip of a special color. The precise amount of work done on a job, each day, is checked up at night and a record kept in the pattern storage office, which shows at any given time how far the order has progressed toward completion. So free from complications and systematic are the methods employed that they require very little clerical labor. Between the pattern storage and the core departments of the foundry is a building in which patterns for immediate use are placed temporarily, awaiting disposition in the foundry. As soon as a man or a gang of men have completed one operation the foreman of the department goes to this building and selects the pattern to be used next.

When work on an order has been finished the pattern is either returned to the main pattern storage building or else sent back to the customer, according to his instructions. At the end of this time a simple card record has been completed which shows when the pattern was received, in what condition, gives a brief description of it, including the core boxes and number of pieces in the pattern, states its exact or approximate valuation, when and how it was returned to storage or to the customer, and also gives the pattern number assigned to it at the Falk Company's works, with section and shelf in the storage building which it occupied while there.

A duplicate of this card on light weight paper is pasted in a book under an alphabetical-numerical arrangement, and the patterns returned to customers are immediately distinguishable by having a large "R" stamped opposite the number of each, so that the record clerk, going through the book, has only to look at the numbers of patterns which are actually in the possession of the company and can find what he wants very quickly.

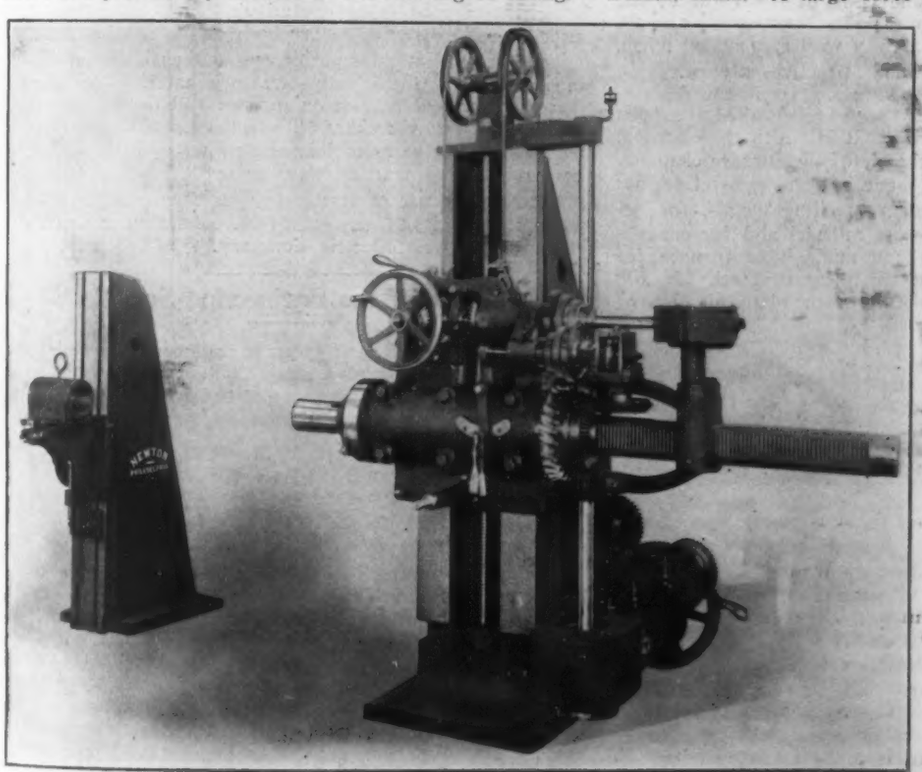
The Falk Company has a well-equipped woodworking shop and makes a specialty of turning out patterns for customers, particularly for duplicate work or that of an intricate nature requiring special care in shrinkage measurements. Some manufacturers of machinery fail to realize the number of ways in which even skilled pattern makers in iron or other metal foundries can find to make bungling jobs of patterns for steel castings. This is a trade in itself, and naturally it is best carried through by men thoroughly experienced in it. At the Falk works a large quantity of lumber is kept constantly on hand so that there may be sufficient stock thoroughly seasoned to meet all operating requirements. The importance of using material in proper condition for castings, thereby insuring against shrinkage or distortion, is not to be overestimated in steel foundry practice.

When business all through the country is slack the advantages of such a system as that above described do not stand out in such strong relief as they deserve to, but during periods when it was difficult to obtain steel castings, without waiting unduly for them, manufacturers were anxious enough to send their orders to the foundries which not only turned out good work but were able to comply strictly with their promises of delivery, etc. With the steadier and more even development of the country's industries more dependence will have to be made upon work of that character and far less upon the haphazard, hit-and-miss operation of the old-fashioned foundry, where "anything went" that a customer would stand for. Meanwhile, however, the value of system in the foundry ought to be recognized and encouraged, wherever found, as similar methods are in other branches of business.

The Newton Combination Portable Boring, Drilling and Milling Machine

A new type of portable boring, drilling and milling machine has been developed by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. The special features of the tool are the use of a special construction to prevent the oil used to lubricate the bearings on the vertical driving shaft from escaping and the furnishing of an improved type of facing arm.

The spindle, which is 5 in. in diameter, runs in capped bearings having an aggregate length of 27⅜ in. It is fitted with a No. 6 Morse taper with retaining drift key slots arranged to drive the cutters by a broad face key. A thrust binder in front of the flange on the spindle is provided as well as a binding bolt to engage the rack sleeve and prevent any movement when milling or facing.



A New Portable Boring, Drilling and Milling Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

The spindle saddle is counterweighted and has hand elevation only although the elevating screw has a top and a bottom bearing. The drive for the spindle is from a General Electric type CR-10 10-hp. motor operating at a speed of from 450 to 1350 r.p.m., the spindle speed range varying from 3.56 to 35 r.p.m.

Four changes of geared feeds ranging from 0.0177 to 0.0709 in. per revolution of the spindle are available and are obtained by steel rack. The drive is through a bronze worm wheel having an outside diameter of 12¾ in. and a hardened steel worm fitted with roller thrust bearings, both being encased for continuous lubrication. To prevent the escape of oil from this box, bushings that revolve with the shaft are employed, an arrangement which it is claimed prevents the escape of oil through the splines of vertical driving shaft.

An improved type of facing arm on which it is possible to obtain an in and out movement for the tool slides by a star feed is included in the equipment of the machine.

The following table gives the principal dimensions and specifications of the machine:

Diameter of spindle, in.	5
Length of feed, in.	32
Minimum distance between the spindle center and base, in.	25
Maximum distance between the spindle center and base, in.	68
Diameter of spindle sleeve, in.	6⅜
Length of spindle bearings, in.	27⅜
Minimum spindle speed, r.p.m.	3.56
Maximum spindle speed, r.p.m.	35
Number of speed changes	4
Minimum speed per revolution of spindle, in.	0.0177
Maximum speed per revolution of spindle, in.	0.0709
Morse taper of spindle	No. 6
Length of spindle bearing upright, in.	26
Width of spindle bearing on upright, in.	20
Width of upright face, in.	26
Base of upright, in.	28 x 46
Tool slide feed, in.	10
Maximum distance between tool post and spindle centers, in.	18

The motor is mounted on a pedestal in the rear, the power being transmitted to the spindle either directly or through back gears, having a ratio of 3 to 1.

Minnesota Steel Company Blast Furnaces

The Pennsylvania Engineering Works, New Castle, Pa., has taken a contract to design, fabricate and erect upon foundations built by the Minnesota Steel Company all the iron and steel work necessary in the construction of two modern blast furnaces on the latter company's site near Duluth, Minn. A large force of engineers are at work designing and detailing, and the New Castle company expects to get into active operation in its shops on this contract within the next three or four weeks. The two furnaces will require upwards of 6000 tons of steel. They will not be completed until the latter part of next year. The contract covers all the iron and steel work, including ten hot blast stoves, gas washing apparatus, cast houses, skip incline, crane runways, etc. The stoves are of the three-pass type, 22 ft. 6 in. in diameter, 100 ft. high. The furnaces will be 21 ft. 6 in. in the bosh, the shells being lined only 12 in. One of the novel features of the furnaces will be the dry cleaning devices for eliminating dust from the gas. From the top of each furnace there will be four uptakes, each leading into a centrifugal dry gas cleaner, the downcomer pipe being taken off from the latter and discharged into another set of centrifugals at the bottom of the furnaces. These centrifugals again discharge into two others of larger size, from which the gas is distributed to the various places for use, some passing through Zschocke washers and some going direct to stoves and boilers. The charging equipment will consist of a single skip with bottom discharge bucket, after the Neeland patent, and will be similar to that in use at the Duquesne, Pa., furnaces of the Carnegie Steel Company. The furnaces will be thoroughly water cooled from top to bottom, the boshes with copper cooling plates and the shells with outside troughs clear to the top.

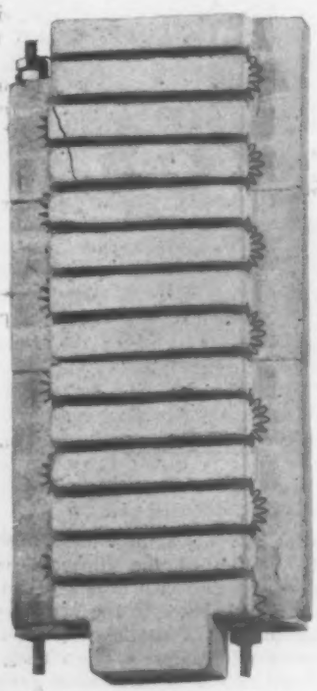
A Replaceable Unit Electric Furnace

An electric furnace in which the electric heating medium comprises a number of units which can readily be replaced in case of a burnout without the expense or delays of sending the furnace to the factory for repairs has been developed by the Multiple Unit Electric Company, 136 Liberty Street, New York City. Briefly described, the furnace heating chamber is lined with these heating units; the units slide into a structure of refractory material forming the body of the furnace; the body joints are closed with elastic refractory cement, and an outside metal covering, say with a japanned finish, gives the furnace a durable and attractive exterior.

Muffle Type of Replaceable Unit Electric Furnace.

The interest in the furnace lies chiefly in the replaceability of its parts and in what may be called the open construction of the replaceable unit in which the electrical heating wire is exposed to the air of the furnace chamber. The furnaces are regularly made in three general forms: One for crucible work, such as melting metals, for determining the recalescent points of steel and for enameling and general small work; a muffle type furnace for hardening and general heat treatment of steel, for different kinds of chemical work, for the determination of ash and for annealing and enameling purposes; a combustion type furnace, built for the heat treatment of tubes, drills, reamers, springs and for carbon determinations in steel and iron alloys.

The accompanying illustrations show the muffle type of furnace and one of the replaceable electric heating units. The muffle furnace is also suitable for heating hardening baths, such as those of lead, cyanide of potassium, etc., and also for oil quenching baths. The counterbalanced hinged door to the furnace opening may in the open position serve as a platform or shelf in front of the opening, where materials under treatment may, for example, be air cooled or temporarily left, as may be necessary in the manipulation. In case of a failure for any reason of the electric furnace it is necessary merely to unscrew, at the four points indicated in the half tone view, the special composition front which, when removed, exposes the end connections of the replaceable units. In a furnace of the type shown there are four of these units which may be removed by the use of a screwdriver. A simple testing plug may be obtained with the furnace, so that one may determine quickly which of the units is disabled.



One of the Replaceable Heating Units.

Each comprises, as indicated in the cut, a number of special form refractory sections bound together with two bolts of a special metal serving also as electrical conductors. The unit has open under-cut slots, and the coiled wire passes through them as indicated. This leaves the wire, the composition of which has been selected to make it resist destruction at high temperature when exposed to the air, in direct communication with the furnace chamber. This means, other things being equal, that a higher temperature is obtainable within the furnace chamber than otherwise, as the resistance material does not have to warm up the refractory lining, which, when the wires are embedded in it, must be higher in temperature than that of the chamber in order that there shall be a flow of heat from the wire to the chamber.

An interesting point is that when desired the wires may be connected in various multiple series arrangements so that without the use of a rheostat, which, of course, dissipates heat, the amount of current may be controlled for regulating the temperature. Where necessary a rheostat is provided complete with the machine, and the view of the muffle furnace shown includes the rheostat at the base. A muffle-type furnace is regularly made in three sizes, the chamber size being 8 x 3½ x 2⅞ in. in one case, 10, 4⅝ and 3⅜ in. in another case and 12, 5¾ and 4¼ in. in another case. In the smallest size the current consumption is 18 amperes at 110 volts and, of course, 9 amperes at twice the voltage. The intermediate size is 20 amperes at 110 volts and the largest size 26 amperes at 110 volts.

The quick replacement of a faulty heating unit makes it unnecessary to delay operations to any extent, as the expense and loss of time are both minimized. It may be added that an interchangeable system has been developed in connection with the body refractory material. The corner pieces for any given size or furnace will do for furnaces of different size chambers, different sizes of distant pieces alone being necessary to join one corner with the adjacent corner. The contraction thus makes it possible to make practically any size of furnace. The furnace is covered by patents granted and pending to M. M. Kohn, manager of the Multiple Unit Electric Company.

Growth of the Engineering Societies

A compilation of the important engineering societies of the United States and Canada has been made by the Engineering News. It shows that the growth of the four principal engineering societies in the past five years has been as indicated below:

	Number of members.		Growth in
	1906.	1911.	5 years.
American Institute of Electrical Engineers.	3,594	7,118	3,524
American Society of Civil Engineers.....	3,569	5,976	2,407
American Institute of Mining Engineers..	3,886	4,200	314
American Society of Mechanical Engineers.	2,929	3,899	970

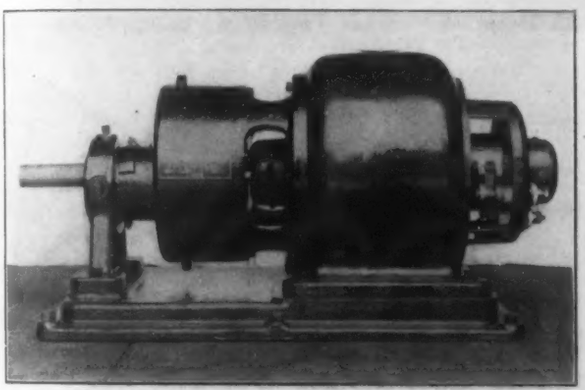
The National Electric Light Association increased its membership by about 1000 in the past two or three months. It had 923 members in 1906 and now has over 9000. The American Iron & Steel Association is credited with a membership of 200 companies and corporations, the American Iron & Steel Institute with 315 members, the American Museum of Safety with 100 and the American Society for Testing Materials with 1350 members. Attention is called to the increase in the number of state engineering societies and of sanitary engineering and water supply associations in five years. Among the more important new societies formed in that period are the American Institute of Chemical Engineers, American Institute of Consulting Engineers, American Metallurgical Society, American Society of Agricultural Engineers, American Society of Engineering Contractors, International Railway Fuel Association, Inventors' Guild, and the Mining and Metallurgical Society of America.

The Columbia Steel Company has about completed the installation of an additional open hearth furnace at Black Diamond, Cal., the work being done under the supervision of S. T. Weliman, of the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

New Model of O'Kelly Speed-Reducing Gear

A new model of the O'Kelly speed-reducing gearing in which the gear case is bolted directly to the motor frame, thus obviating the necessity of a coupling between motor and the reducer, has been developed by the D. O. James Mfg. Company, West Monroe street, Chicago. It may be recalled that in *The Iron Age* of July 30, 1908, a somewhat extended article descriptive of the reducing gear itself and illustrating a number of applications appeared. A special feature of the gear is that a high-speed pinion turned solid on the driving or motor shaft transmits power through three idler pinions 120 deg. apart to an internal gear, which in turn drives the slow-speed king pinion. The accompanying illustration indicates the compactness of the speed reducer, its promising strength, that it is entirely closed and oil tight and that it offers no belting or projections likely to be a menace to the operatives.

Besides the model shown in the illustration, which is known as model A, another model has been developed, model B for higher speed reductions and heavier work. Model A is designed to step down a motor speed of 960 r.p.m. to 150 r.p.m. There is a common bedplate and common end bearing, an arrangement calculated to maintain perfect alignment of the reducer and the motor. Model B, built in sizes ranging from ⅛ to 75 hp. and offering speed ratios varying from 4 to 1 to as high as



Direct Attached Speed-Reducing Gear Made by D. O. James Mfg. Company, Chicago.

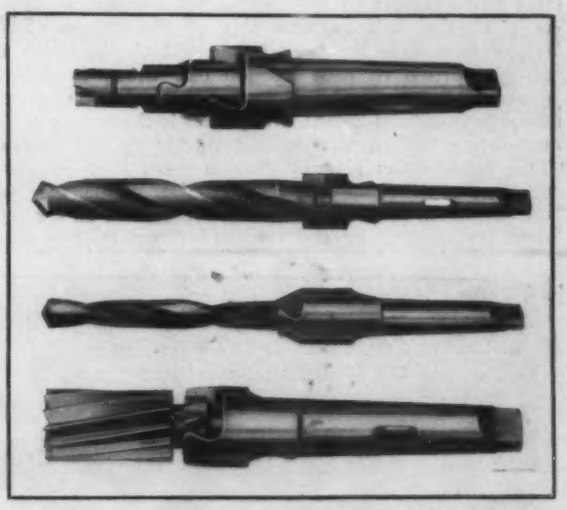
600 or more to 1 is coupled direct to the motor with a universal coupling. For extreme reductions in speed a second internal gear, as explained in the earlier article referred to, completes the train and drives the shaft from which power is taken. The use of three idlers is required in giving the transmission a well balanced drive of ample emergency strength and to avoid one-sided strain likely to result from a single gear and pinion.

All moving parts run in the same direction and the oil-tight enclosure allows splash lubrication from an oil bath. The bearings are of the chain oiling type and are bushed with Lumen bearing metal. The oil chamber carries a considerable quantity of oil, which, in the absence of any stuffing boxes, is retained by means of a special oil groove and guard. The oil grooves catch the drip from the shaft and return the oil to the chamber. The gears are made of 0.6 carbon forgings. The idlers are also bushed with Lumen bearing metal and are carried on case-hardened and forged steel pins. The internal gears are made of semi steel. These reducers are are furnished complete with motors and starting boxes, if desired.

The Bureau of Manufactures of the Department of Commerce and Labor, has just issued a pamphlet of 15 pages called "Promotion of Commerce." After a rather full description of the work of the Bureau of Manufactures, it outlines in short paragraphs, somewhat after the manner of the Congressional Directory, the duties and functions of various branches of the Government which are carrying on service related to the promotion and development of trade and manufacture. Over thirty bureaus and branches of the Government are listed from the various departments.

The Corona Drill Socket

A new type of drill, reamer and milling tool socket has been recently placed on the market by the Corona Mfg. & Supply Company, 311 Atlantic avenue, Boston, Mass. This new device, which is known as the Corona socket, is designed to take all standard twist drills or other drills made up of twisted shapes, the drive being against the twist. The advantages claimed for the socket



Four Possible Combinations of the Corona Drill Socket Made by the Corona Mfg. & Supply Company, Boston, Mass.

are that there are no broken tangs or worn sockets due to drills turning, the drive is direct which is emphasized as tending to eliminate breakage of the tools, a large range of work can be accommodated due to the nesting feature and with the large sized drills from 3 to 5 in. in length is saved. Drills, the tangs of which have broken, can be machined to fit this new socket by cutting through the flute to the root of the shank. In the case of a new twist drill the benefit of the tang drive is secured as well as the advantages of the flute drive.

With the standard twist drills the flute is carried through to the root of the shank but not below its diameter. With drills made up from twisted shapes the shank is turned without changing the original form. The socket in either case engages and drives from the flute as shown in the two middle views of the accompanying engraving. Milling tools and reamers are made with a taper shank, having an engagement to take that of the socket as shown at the bottom. In this way the tang drive is entirely eliminated. In the view at the top four sockets are seen nested together and when a fifth one is added it is possible to take drills having a maximum diameter of 1 in. The largest size of drill taken by the biggest socket is 3 in. As the device is interchangeable with Morse and other standard taper sockets, the sockets can be utilized as part of the equipment of drill press spindles.

A Corporation Recipe.—The Wall Street Journal has the following: "Dissolution stew: Take a solvent, well-managed and healthy corporation. Investigate thoroughly. Roast in the public press as long as it can be kept hot. To one part prejudice, two parts political demagoguery, add half-baked laws one after the other until the corporation dissolves into thirty-three parts. Issue fractional certificates and serve hot with campaign sauce."

Much interest is taken at Cincinnati in the newly completed Government Fernbank dam, about 10 miles below the city. This is the largest dam on the Ohio River. The Cincinnati Business Men's Club, the prime mover in promoting the dam, made a special inspection trip Aug. 5. Nearly 1,000 members and guests were on a steamer that passed through the locks.

The Adrian Furnace Company, Du Bois, Pa., expects to have its furnace, which is now being relined, ready for blast about the middle of October.

The Caterpillar Traction Engine

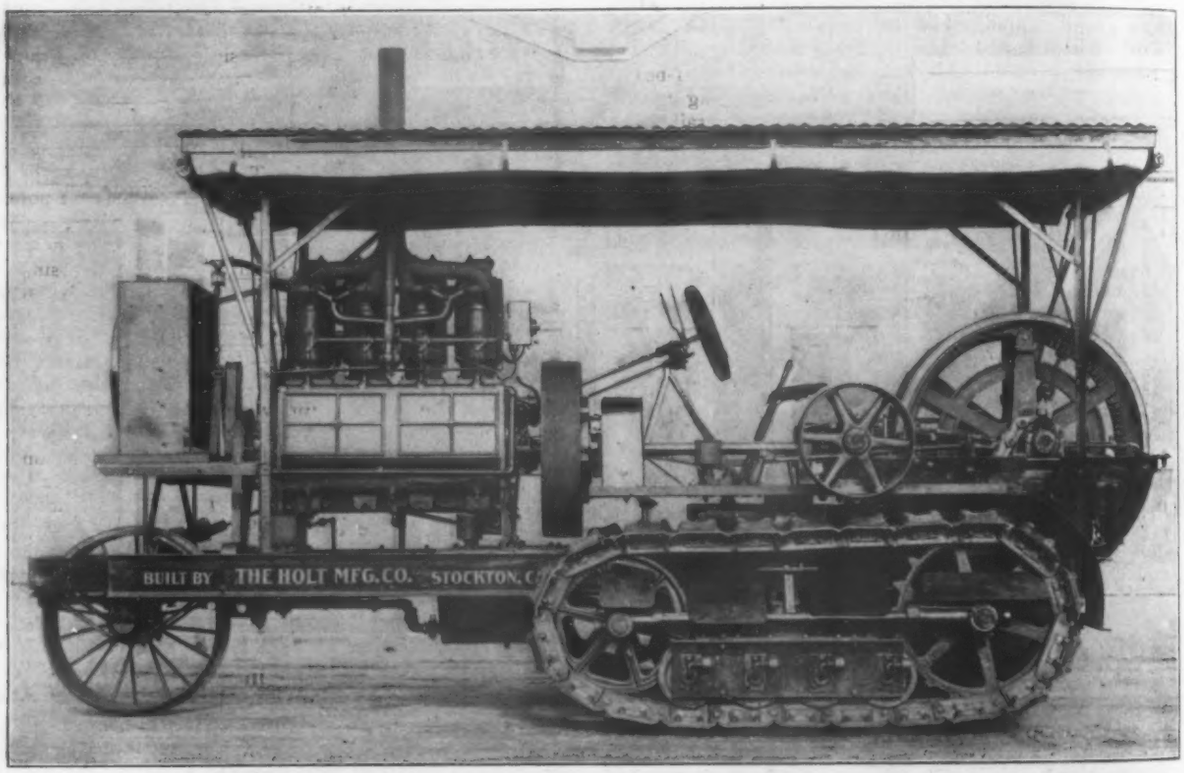
Absence of Traction Wheels a Special Feature

A traction engine without traction wheels is somewhat of a anomaly. In the new engine developed by the Holt Mfg. Company, Stockton, Cal., a tractor has been developed which is characterized by the entire absence of the customary traction wheels. In this engine the traction parts consist of an endless series of track sections or a traction belt on each side of the tractor. Roller trucks supporting the main frame rest on the upper side of the portion of each traction belt which touches the ground. Power is applied to the rear sockets supporting the traction belts which are pulled backward under the supporting rollers, causing the tractor to roll forward. This construction gives a traction area, it is calculated, equal to a wheel approximately 100 ft. in diameter with the additional advantage that the weight rolls on a smooth steel track. One of the special features of the engine

The Engine

The motor used is of the four-cylinder, four-cycle water-cooled type and is rated at 60 hp. The cylinders are cast separately and have a 7-in. bore and an 8-in. stroke. The rated speed of operation is 500 r.p.m. Soft grey iron is used in the construction of the crank case, which contains five rigid supports for the main crank bearings, which are 2 15/16 in. in diameter and are lined with a special bearing metal. The aggregate length of these bearings is 24 11/16 in., divided among the rear bearing, which is 8 in. long, a front bearing 4⅞ in. long and the three center bearings, each of which is 3 15/16 in. in length. Emphasis is placed on the fact that the design of the crank case is such that any bearing, piston or connecting rod can be removed without disturbing any other part of the motor. An automatic leveling oil reservoir to insure proper lubrication for all parts of the motor is also contained in the crank case.

Plastic bronze bushings are used for the rods. The wrist pins, which are made hollow to allow for expansion,



The Caterpillar Traction Engine Built by the Holt Mfg. Company, Stockton, Cal.

that will be noted from the accompanying engraving is the ease with which all parts of the engine can be inspected.

The caterpillar or platform wheel possesses the advantage of giving a smooth road for the tractor at all times. The flexible track bridges over inequalities in the surface in the ground and it is found relieves the entire tractor of practically all the jerks, jars and roughness which it would otherwise receive. The platform wheels proper are composed of four semi-steel rollers suspended from the main frame by springs, one cast-steel driving sprocket and a single idler which carries the track. The four rollers run on roller-bearing hardened steel shafts well lubricated and dustproof, an arrangement which is not only simple but strong. The track is built up of a succession of large open links, made of specially rolled high carbon plow steel. Case hardened pins turning in sleeves of malleable iron bushed with hardened steel are used for the joints and this peculiar construction, it is explained, makes them practically dustproof and insures long wear. The track base plates and the shoes are bolted to the links, the former being made of drop forged plow steel. A special feature of this track is that it contains no rapidly moving parts, and that the weight is always evenly distributed. As the large bearing surface provided measures over 2000 sq. in., the weight per square inch is approximately 9 lb., which is very different from an ordinary round wheel where the weight is concentrated on one point.

measure 2 17/16 in. in diameter. Positive lubrication is secured through the use of an automatic leveling oil reservoir in the base of a crank case, while a sight feed located directly in front of the operator shows him at all times just how much oil is being fed. The lubrication of the various parts is by the splash system. The dual ignition system is of the jump spark type and comprises a high tension magneto and a set of dry cells operating through a spark coil. The carbureter is of a special design, which is said to give a perfect mixture under all conditions. Circulating water driven by a centrifugal pump to a large vertical radiator mounted directly in front of the engine assisted by a large fan between the radiator and the engine is utilized in cooling the engine. The construction of the radiator is such that it can be completely drained to prevent freezing in cold weather.

The Transmission System

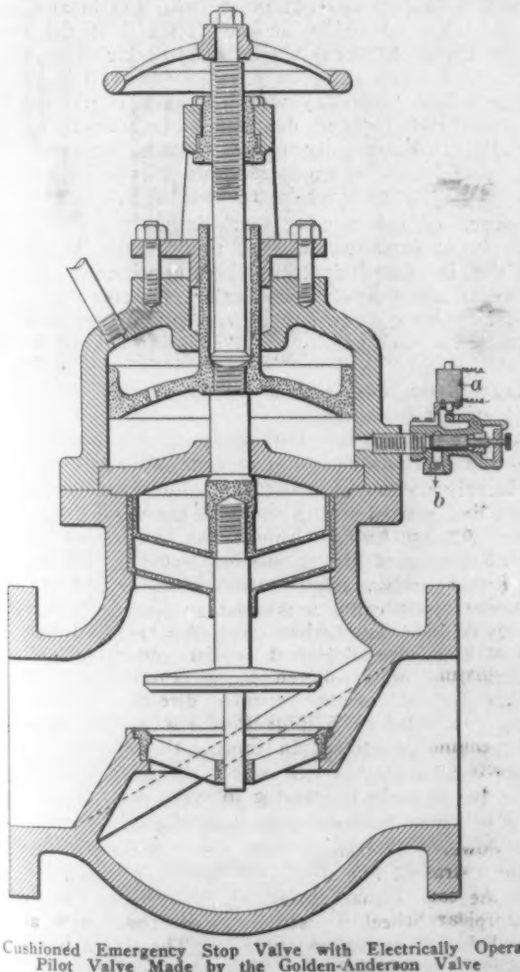
Power is transmitted through a multiple disk clutch and a straight line shaft with bevel gear from the engine to the countershaft, from which a chain drive to each caterpillar wheel is used. All of these parts are controlled by independent frictions. The clutch is composed of two friction fiber disks operating between three plates of soft grey iron. This is said to enable the load to be gradually picked up without jerk or jar and in action to remain engaged. The gearing providing the necessary speed changes is located at the rear end of the engine frame and consists of two large semi-steel bevel gears

carried on a large diameter steel shaft, together with a double high carbon steel beveled pinion mounted on an extension of the crank shaft. The diameter of these bevel gears is over 4 ft., a size which gives exceptional wearing qualities. When the pinion on the crank shaft extension engages the bevel gear at the left, the engine moves forward, while by shifting the pinion to engage the right bevel gear the direction of motion is reversed. For securing a higher speed the pinion is shifted longitudinally on the crank shaft extension so that it engages with the second face of the bevel gear on the left. All the control levers are within an easy reach of the operator and the speed changes ar easily made. In this way it is possible to secure two forward and one reverse speed on a direct drive with no reduction gears in mesh. From the large bevel gears on the countershaft, power is transmitted by a double chain drive to the cast-steel spring drive sprockets of the platform wheels. Each of these drives is independent of the other, and the power is applied to either one or both of the wheels by a friction clutch operating on the inside rim of the large bevel gears. This arrangement enables the machine to pull a load with one wheel in an emergency and also allows it to be turned within its own length.

The frame of the engine is composed of 8-in. I-beams braced and mounted with springs on supporting trucks. The principal dimensions of the engine are overall hight, 11 ft.; length, 18 ft. 7 in.; extreme width, 7 ft., and tread, 82 in. The weight of the engine is approximately 9 tons. The average fuel consumption of the engine is said to be 40 gal. of distillate per 10-hr. day, while a gallon of lubricating oil will last the same length of time.

An Electrically Operated Stop Valve

The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., has recently brought out a new type of triple-acting quick-closing stop valve which is equipped with an electrically operated pilot valve. This valve is intended to furnish a quick and reliable means of protecting the steam lines in a power plant in case of accident such as the bursting of a pipe, valve or fitting and is a combination of an automatic non-return valve, an automatic safety stop valve, an automatic emergency-stop valve and a hand-stop valve all in one.



A Cushioned Emergency Stop Valve with Electrically Operated Pilot Valve Made by the Golden-Anderson Valve Specialty Company, Pittsburgh, Pa.

The Corliss dash pot method of cushioning the triple valve is used and consists of two dash pots with a steam connection between them leading to the pilot valve which was illustrated in *The Iron Age*, February 10, 1910. A by-pass is employed to admit the full boiler pressure on both sides of the inner dash pot, which is therefore balanced. If the steam line should become ruptured, the pressure on the upper side of the pilot valve diaphragm would be removed and the pressure from between the two dash pots of the triple valve would be exhausted which would then close.

The construction of this triple valve is shown in the accompanying engraving, the pilot valve with its solenoid being at the left. The solenoid *a*, which controls the operation of the pilot valve is of the same general type as that employed by the Cutler-Hammer Mfg. Company in its solenoid operated valves, an illustrated description of which appeared in *The Iron Age*, March 16, 1911, but special modifications were made in its design to meet the requirements of this particular case. The pilot valve is normally held in place by a balanced latch having a trigger at one end. The solenoid is arranged so that its plunger will give a downward blow to the other end of the lever, which is sufficient to upset the latch. This releases the pilot valve and the steam in it passes out through the exhaust port *b* and the main valve closes. The solenoid is arranged with a frame and a plunger, the latter being normally held up by a spring. When the coil is energized by the closing of the electrical circuit due to the pressing of a push button the plunger will move about ⅛ in. and strike the blow which unseats the latch that holds the pilot valve in position. These push buttons can be located wherever desired around the plant and the steam supply can be thus shut off in case of accident without having to go to the boiler room to close the valve on the header.

Bronze is employed throughout in the construction of the valve with the exception of the coil spring in the pilot valve, the lever and the latch. The spring is made of tempered steel, while tool steel is employed in the construction of the other two parts. The pilot valve has a ½-in. pipe connection to the triple valve and a ⅜-in. connection to the main header.

Official List of Machine Tool Builders

The National Machine Builders' Association, through its secretary, Charles E. Hildreth, Worcester, Mass., has published an Alphabetical and Segregated List, which constitutes a directory of the industry that should be an important handbook. It contains the names of the members of the association and a classification of the members by headings according to the kinds of machinery which they manufacture, each class being thoroughly sub-divided. In this way no less than 154 distinct kinds of machines are enumerated. The list will prove a great convenience to those who desire the names of manufacturers of a given type of machine. For instance, under gear-cutting machines 14 names and addresses are given. The list, which is accurate in every detail, has been compiled at considerable expense, and consequently to non-members of the association the price is 50 cents.

The blast furnace of the Star Furnace Company, Jackson, Ohio, is now being rebuilt and a new stove, new blowing engine and new stock bins will be added. The rebuilt stack will be 70 x 16½ ft. and will have a capacity of 30,000 tons of ferrosilicon or 60,000 tons of foundry iron a year. It is expected it will be ready for blast in 1912. When the stack was blown out two months ago it had been operated continuously on the same lining on ferrosilicon for four years and five months.

The New Jersey Zinc Company completed the dismantling of its furnace B, near Newark, N. J., some time ago. It is probable that its furnace at South Bethlehem, Pa., will not be operated again. Both the furnaces at Palmerton Pa., are now running.

New Brace Miller

For milling the ends and chamfering one edge of each of two 8x8 in. angles simultaneously, the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., has brought out a new type of brace milling machine. Where the volume of work handled is

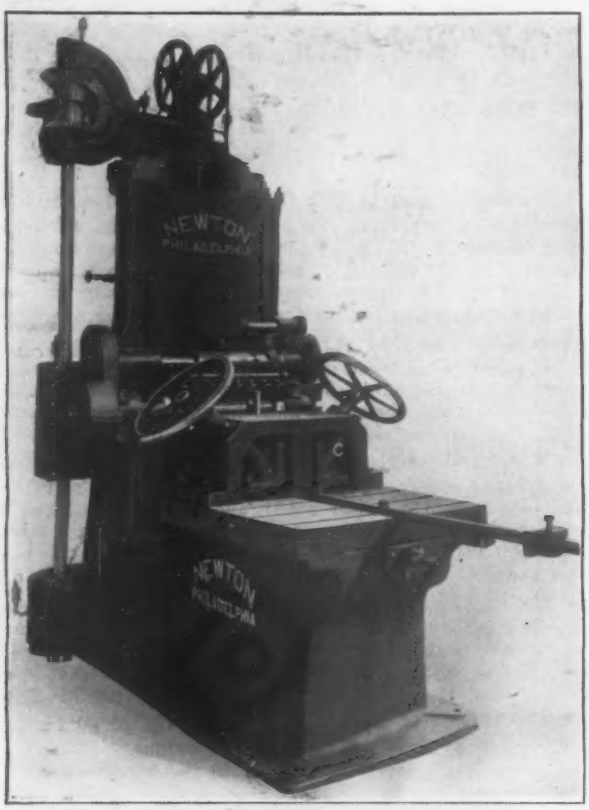


Fig. 1.—A New Brace Milling Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

sufficiently large, two uprights are furnished on a base which enables the finishing and the chamfering of both ends of the pieces to be performed simultaneously. A general view of the machine is given in Fig. 1, while the vise is shown removed in Fig. 2 so that ends of columns can be finished by the miller.

The spindle which is arranged to drive the cutter

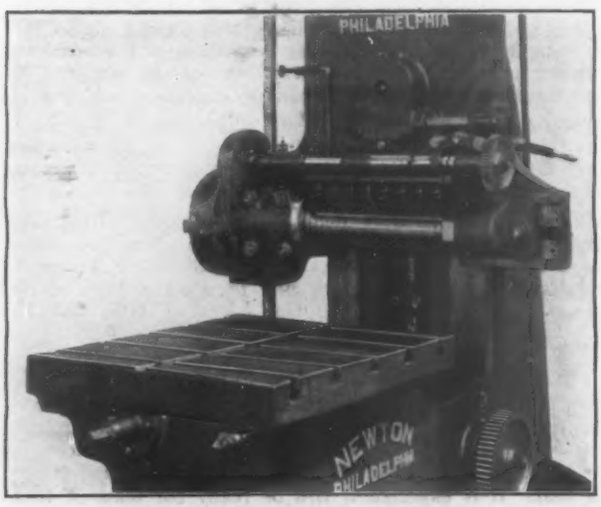


Fig. 2.—A View of the Table Showing the Vise Removed for Finishing the Ends of Columns.

arbor through a broad face key is 5 in. in diameter and is fitted with a No. 6 Morse taper. A through retaining bolt holds the arbor in place and cutters having a maximum diameter of 8 in. and a length of 24 in. can be used, the length being made up either of one or several cutters aggregating the required dimension. Square locked bearings, which are the standard of this company's machines, are employed for fitting the spindle saddle to the upright, while the necessary adjustments for wear are made by taper shoes. A counterweight is provided for the saddle, which has four changes of vertical feed secured through change gears as well as a reversing fast power traverse and hand adjustment. The dimensions of the work table, which has a 6-in. in and out hand adjustment, are 39 in. in length and 36 in. in width. Taper shoes are used to adjust the table to the base.

The vise for holding the angles was formerly cast solid with the table, but in the new type is made a separate casting and is therefore removable. This construction, which is shown in Fig. 2, enables the machine to be employed for finishing the end of columns. One of the special features of the vise is that the jaws are operated independently by hand wheels mounted on the adjusting screws and special provision is made to control the parallel position of the jaws when being elevated by the insertion of two circular guides on which springs are mounted at C, Fig. 1.

The frame of the machine is one solid casting and the floor space occupied is 60 x 92 in., these being the maximum dimensions. The power for the drive is furnished by a General Electric type CQ-10 10-hp. motor, having a speed range of 600 to 1200 r.p.m.

Hours and Wages in the Iron Industry

Secretary Nagel, of the Department of Commerce and Labor, made a report to the Senate last week, in response to the resolution of Senator Borah calling for an investigation of labor conditions in the iron and steel industry. The inquiry, it is stated, covered practically all the iron and steel manufacturing plants in the country, numbering 344. The report says that "the fact that stands out most strikingly in any study of the labor conditions in the iron and steel industry in the United States is the extent to which the 12-hour day and a week of seven days still prevail in this industry. The seven-day working week is not confined to the blast furnace department, where there is a metallurgical necessity for continuous operation, but also was found to a considerable extent in other departments for commercial reasons only."

Much of the Sunday work is no more necessary than in other industries, the report says, in pointing out that in other industries where continuous operation is necessary entirely practicable systems have been found by which one day of rest out of seven can be secured for each employee. "It is in striking contrast to the general tendency in other industries to find in a great basic industry that approximately only 15 per cent. of the 90,000 employees in special iron and steel occupations work less than 60 hours per week, and almost 50 per cent. 72 hours or over per week."

Nearly 60 per cent. of the employees are foreign born, and nearly two-thirds of these are of the Slavic race. Almost half of the 90,000 employees, according to Secretary Nagel, receive less than 18 cents an hour, one-quarter under 25 cents an hour and the other one-fourth, 25 cents and over an hour. A few very highly skilled employees, however, receive $1.25 an hour. Those receiving 50 cents and over an hour number less than one-twentieth.

The heat developed by machinery in motion is sometimes considerable as indicated in some figures collected by a committee in England appointed by the Home Secretary of State to investigate conditions in cotton mills. The average amount of heat given up by the looms in three weaving sheds on a cloudy day was about 62 per cent. of the total generated in each shed. The amount of heat emitted by the operatives averaged about 21 per cent. and the amount of heat radiated from steam pipes amounted to about 17 per cent. To determine the effect of sunshine on the temperature, observations were taken in a number of sheds of the rise in temperature between 6 a. m. and 5.30 p. m. on both cloudy and sunny days and it was found that the average increase due to the sun was 38 per cent.

The Machinery Markets

The railroads are becoming more active in the East. Some small lists of requirements are out in the New York market. The Baltimore & Ohio Railroad is preparing a list of machine tools for large shops to be built at Baltimore and Grafton, W. Va. This business will probably be placed from Baltimore. A more active demand has developed in Philadelphia, where trade had been unusually quiet. The Chicago & Northwestern Railroad has a list calling for $12,000 worth of machinery which has been distributed in the Chicago trade, and the International Harvester Company is preparing to issue another list in that market. The automobile trade continues the center of activity in Detroit, but a good call has developed there for contractors' equipment. The machine tool demand has fallen off on the Pacific coast, although the Southern Pacific Railroad has placed orders against a small list of metal-working equipment. The demand for contractors' machinery and for machinery used in the Southern California oil fields continues excellent. There is a noticeable improvement for all lines in the South. Power machinery, electric apparatus and machine tools lead in activity there, and some municipal enterprises for the construction of water works and power and light plants are being started.

New York

NEW YORK, August 9, 1911.

There are indications that the railroads will shortly become more active purchasers in this market. The Delaware, Lackawanna & Western is inquiring for a small lot of machine tools for replacement. Some of the machines are to be installed at the Buffalo shops. The Pennsylvania Railroad has been making inquiries for metal working equipment, but its requirements are not large. The New York Central has not as yet closed for any part of the large list of machine tools it has had out in this market for several months, but the bids are now in the hands of the purchasing department. Some good business has been placed within the last two weeks by the Saurer Motor Company, Plainfield, N. J., and a few tools are yet to be bought against this list. Other motor truck manufacturers have been buying freely of late, but their purchases are principally for replacements. Inquiries from other sources are coming in in fairly good volume.

Manufacturers of Corliss engines have been getting better inquiries and some good sales of small power units have been made for manufacturing lofts and office buildings in the vicinity of New York. A number of New York houses have been selling some good round lots of machine tools and metal-working equipment to Canadian car manufacturers and the Canadian railroads have been good customers for machinery for their locomotive and car erecting shops.

The Long Island Railroad has secured permission from the Public Service Commission for the electrification of its Port Washington branch, and work on the project will be begun as soon as possible. Plans are entirely prepared and it is proposed to have the line ready for service within the next six months. This means that the company will be in the market for considerable power equipment in addition to contracting machinery and electric locomotives.

The Cambridge Company, which is affiliated with the Riverside Steel Spring Company, Riverside, N. J., is erecting an 18-in. rolling mill at Riverside to roll sections for special steel springs. The mill will be installed in a building 50 x 125 ft. and the company will install a 150-hp. gas engine with generator. Power will be supplied from this plant for other industries.

The Pelton Water Wheel Company, through its Eastern office at 90 West street, New York, has been awarded a contract by the Department of the Interior of the United States for a water power plant to be erected at Carite, Porto Rico, to be used in connection with irrigation work. The plant will be capable of developing 1000 hp., and it will include a driving and main generator of 50 hp. and an exciter wheel, both direct connected to work under a 750-ft. effective head. The generator and exciter wheel will be equipped with Pelton oil-pressure governors. The contract includes the construction of a pipe line approximately 2300 ft. long. An additional wheel of like capacity will be installed in connection with the same work later on.

The Harrisburg Mfg. & Boiler Company, Harrisburg, Pa., which is controlled by the Pelton Water Wheel Company, whose Eastern office is at 90 West Street, New York, is erecting an addition 152 x 155 ft., which is arranged for a later extension of the same size. The new building, it is understood, will be used as an Eastern plant for the Pelton Water Wheel Company, whose main factory is at San Francisco.

The Titan Steel Casting Company, whose plant is at the foot of Chapel street, Newark, N. J., is taking bids for construction of an addition to its main foundry, which is to be 150 x 200 ft. in size, and 42 ft. high. The building will be of modern steel construction. For the present the structure will be served by the cranes in the existing foundry and later on additional apparatus will be installed.

The Locomotive Economy Company has been organized with an authorized capital stock of $20,000 to manufacture railroad appliances. The principal incorporator is E. Ormonde Powers, 15 Broad street, New York.

The Oil Power Company has been incorporated with a New York charter and authorized capital stock of $100,000 to manufacture oil engines under patents controlled by Leon Wygodsky. The company is planning for the erection of a factory, but has not as yet decided on the site. Mr. Wygodsky can be addressed at 2103 Crotona avenue, New York.

The building containing the lead pipe casting department at the plant of Charles Miller & Co., Utica, N. Y., was damaged August 1 by an explosion caused by the accidental dropping of a small quantity of dynamite into a melting kettle containing five tons of molten lead. The building will be rebuilt at once.

The Stecher Lithographic Company, Rochester, N. Y., is to build a two-story addition, 85 x 368 ft., to its plant on North Goodman street. The building will be of reinforced concrete and is estimated to cost about $85,000.

The Rochester Steel Casting Company, Rochester, has been incorporated with a capital stock of $50,000 to manufacture steel castings and deal in foundry appliances and supplies. The directors are Frederick C. Kimmel, P. V. C. Jackson, J. C. Emery, and others, of Rochester, and A. Thompson, of Baltimore, Md.

The J. A. Seitz Company, Syracuse, N. Y., has been incorporated for the purpose of manufacturing motors, engines, etc., with a capital stock of $50,000. The incorporators are Jacob A., B. M. and J. W. Seitz.

The Syracuse Rapid Transit Railroad Company is receiving bids for the erection and equipment of transforming station 62 x 65 ft., two stories, to be located on Townsend street, Syracuse, N. Y.

The Walter C. Goddard Company, Rochester, has been incorporated to manufacture and sell mechanical and electrical machinery. W. T. Goddard, E. C. Goddard and J. M. Cook are the incorporators, with offices at 1007 Monroe avenue, Rochester.

The Munson Bros. Company, Utica, N. Y., manufacturer of iron castings and mill supplies, has plans in preparation for a foundry building 100 x 200 ft., one story; a pattern building 50 x 160 ft., one story; a warehouse and shipping building, 50 x 300 ft., one story. The plant will occupy a site at Whitesboro, N. Y., and will be of steel frame construction, with concrete foundations and brick walls.

An extensive plant for the manufacture of carbonic acid gas is to be built at Mill and Bridge streets, Albany, N. Y., by the General Carbonic Company, formerly of Saratoga Springs. The plans call for a main building, 118 x 154 ft., one story, and is estimated to cost $100,000. Bids are now being received for tanks and apparatus of various kinds.

The American Radiator Company, Buffalo, is adding to its Pierce plant, at Elmwood avenue and the New York Central Railroad Belt Line, a brick foundry building estimated to cost $25,000.

The Republic Metalware Company, Buffalo, has completed plans for a machine shop and storage building which it will at once add to its plant at Republic and Tennessee streets and the Erie Railroad. The building will be of reinforced concrete, with concrete

THE MACHINERY MARKETS

floors, 91 x 102 ft., and wing 38 x 52 ft., all three stories. New machinery equipment will be installed.

The Bassett Motor Car Company, Buffalo, has been incorporated with a capital stock of $10,000, and will establish a plant in that city for the manufacture of motor boats, motor cycles and motor vehicles, with offices at 960 Main street. Among the incorporators are Frank Bassett, Edward J. Meyer, Alexander G. Hoefler and Alfred A. and John F. Bessick.

New England

BOSTON, MASS., August 8, 1911.

The machinery market is dull, but the condition is seasonable, of course. The common belief is that were these the autumn months the existing influences would create an active demand for machine tools and mill supplies of all descriptions. The General Electric Companies has made the necessary appropriation for a large shop building at Lynn, Mass. This is the extension for which an inquiry for some $75,000 worth of machine tools was out some months ago, and the deduction is that the further appropriation for this purpose will be forthcoming before the end of the year. It is understood that the United Shoe Machinery Company, Beverly, Mass., will defer until next year the purchase of equipment for the large extensions in process of erection. Dealers in tool steel report increased sales to railroad shops and to builders of railroad equipment all over the country.

The Lapointe Machine Company, Hudson, Mass., manufacturers of broaching and other metal working machinery, has elected F. F. Cutting president and general manager. J. N. Lapointe retires from active connection with the business, and, with his son Frank J. Lapointe, is equipping a shop in the Longley Building, Marlboro, Mass., for the manufacture of machine tools. Ralph R. Lapointe has been made superintendent of the Lapointe Machine Company. Colonel Cutting has been secretary and a director of Hill, Clarke & Co., Inc., Boston, Mass., with which business he has been connected for a long time. Ralph R. Lapointe has resigned the superintendency of the Universal Boring Machine Company, Hudson, and his successor has yet to be named. He has had a prominent part in developing the Universal boring machine.

Albert R. Stedfast has been elected secretary, sales manager and a director of Hill, Clarke & Co., Inc., Boston, and assumed his new duties July 1. He has been with the company for 27 years, and is prominent in the New England territory as a machine tool salesman.

The North & Pfeiffer Mfg. Company, manufacturer of screw boot calks, has moved its business from New Britain to Hartford, Conn. The former management has disposed of its interest and the board of officers now consists of Ernest Walker Smith, president, and John B. Hart, secretary and treasurer. New capital has been added and the business is being extended in a large way.

The W. T. Fields Company, New Haven, Conn., announces that it has arranged to take over a controlling interest in the Hopkins & Allen Arms Company, Norwich, Conn., manufacturer of guns and pistols. In order to accomplish the transaction it was necessary to agree to purchase all stock which might be offered and the Fields Company will probably acquire a somewhat larger amount than that required to secure the control. Details of the ultimate ownership and management of the flourishing business are not now available.

The Peck, Stow & Wilcox Company, Southington, Conn., voted at its annual meeting to increase its capital stock by $250,000. The new funds will be used for the erection and equipment of new buildings, consisting of a machine shop and warehouse, iron foundry, forge shop, woodworking shop, power house and other structures for miscellaneous purposes. The buildings will be used principally for taking care of the manufacturing now done at factories at East Berlin and Plantsville, Conn., thus concentrating the business at the main plant at Southington. At the annual meeting these officers were elected: President, L. H. Treadway; vice-president, M. H. Holcomb; secretary, Luke E. Fichthorn; treasurer, E. N. Walkley; directors, Mr. Treadway, Mr. Fichthorn, Mr. Holcomb, Webster R. Walkley, Marcellus B. Wilcox, S. H. Wilcox, A. R. Treadway, F. L. Wilcox and F. C. Sumner.

The New Haven Machine Screw Company, New Haven, Conn., will build an addition to its plant 40 x 115 ft., two stories, with a wing for toilet rooms. The structure will be of reinforced concrete of slow burning mill construction, with steel sash.

The Artistic Bronze Company, through its engineer, H. B. Close, 326 Colorado avenue, Bridgeport, Conn., is in the market for an oil or gas engine and electric generator as well as a considerable number of 2, 5 and 10-hp. motors. Other equipment will be purchased later for the new factory at Bridgeport, to which the company will move from Norwalk, Conn.

The Harriman Motor Works, Inc., Glastonbury, Conn., has been petitioned into bankruptcy by creditors, and George H. Barton, West Hartford, Conn., has been made the receiver. The company manufactures motors and engines, specializing on aeroplane engines.

The George D. Mayo Machine Company, Boston, has let the contract for an addition to its plant at Laconia, N. H. Work will be started at once and is expected to be completed in the early fall. This addition will probably necessitate purchases of additional machine tools but a list has not as yet been prepared.

The Water Board of Lawrence, Mass., will receive bids until August 23 for furnishing turbine-driven centrifugal pumps and condenser of 3,000,000 gal. capacity.

Philadelphia

PHILADELPHIA, PA., August 9, 1911.

The indifference of probable purchasers to the closing of pending negotiations keeps the local machinery market rather narrow. There is considerable business in sight, including a few fair propositions. Prospective buyers, who are making extensions to plants or building new ones, appear to be in no hurry to consider purchases of equipment. Meanwhile business drags and continues largely confined to scattered single tool sales. There is still an absence of any material demand from the railroads in this territory; although builders of special equipment for railway shop work report a trifle better demand from railroads in other districts. Business in the special tool and machinery lines is somewhat better than that in the standard lines, although few makers of such equipment are very actively engaged. Tool stocks in merchants' hands, as well as builders' warerooms, continue to increase and in instances extra efforts to move them have not been particularly successful. Current inquiry for either metal or woodworking machinery is light. The second-hand tool and machinery trade reports the market as irregular.

The export trade as far as the standard lines of machine tools are concerned is light. A small amount of business is going in some classes of special machinery; while trade in power equipment specialties appears to be fully maintained. Some few steel-casting plants are taking on a little more business, although orders are practically all for prompt delivery and but little forward business is on the books. Gray iron foundries appear a trifle more active, but in very few cases has the increase been due to orders for machinery builders.

It is stated that the plant of the Columbia Gray Iron Company, Columbia, Pa., recently damaged by fire, will be rebuilt at the earliest possible moment.

The Eagle Coal & Ice Company has purchased an acre of land at Fifty-seventh and Hoffman avenues, West Philadelphia, and is having plans prepared for a concrete building 100 x 250 ft. for ice making. The type of equipment for the plant is now being considered.

A merger which will include a number of the large Eastern manufacturers of ventilating devices has been practically determined upon. The Pullman Automatic Ventilator Mfg. Company, York, Pa., has practically been sold to the new company, in which New York capital is interested. Concerns in Rochester, N. Y., and New York City are to be included in the new corporation. While details have not been completed, it is stated that the new concern will have a capital stock of $800,000.

The Reading Crane & Hoist Company, Reading, Pa., has installed three overhead traveling bridges in the new shop of the Pennsylvania Shafting Company, Spring City, Pa., and is building an 84-ft. span plate girder crane for the Anglo Newfoundland Development Company. Order books are said to be in very good shape and several good inquiries are noted.

The Hess-Bright Mfg. Company, manufacturer of ball bearings, Twenty-first street and Fairmount avenue, has purchased a tract of about 14 acres of land

THE MACHINERY MARKETS

at Erie avenue and B street from the Pennsylvania Railroad Company, with the idea of erecting a new plant thereon at some future date. No definite plans have yet been considered.

The Light Mfg. & Foundry Company, Pottstown, Pa., continues to operate at about its normal capacity, although fewer large orders are on hand. A number of improvements to the plant of this company have been in contemplation, but action has been deferred until the outlook for future business is more favorable.

Contractors are figuring on the construction of a number of buildings to serve as car repair shops for the Baltimore & Ohio Railroad, Baltimore, Md. These consist of engine house, 60 x 112 ft.; sand house and tower, 15 x 45 ft.; ash and inspectors' pits, 10 x 250 ft., and minor buildings. M. A. Long, Baltimore, Md., is the engineer.

The Birdsboro Steel Foundry & Machinery Company, Birdsboro, Pa., is building a new erecting shop 120 ft. long, in which a Morgan 30-ton electric crane, having a 60-ft. span, with a 10-ton auxiliary hoist, will be installed. An 8-in. vertical boring mill, 60-in. open side planer, vertical milling machine, drill presses, and erecting and testing stands for pumps and other machinery, contracts for which have been placed, will be installed. This company has just shipped two large, electrically driven pressure pumps for the Chino Copper Company, weighing 135,000 lb. each, for special duty service.

The Royersford Foundry & Machine Company, Royersford, Pa., has recently completed the installation of additions to its power plant. This company reports the demand for its line of punch and shears as rather quiet, but notes continued increasing interest in its line of Sells Roller Bearing Devices. General business during July was hardly equal to that of the previous month, although a fair share of the business offered in its various lines is being booked.

The McLaughlin Brothers, Inc., Baltimore, Md., have been awarded the contract to design and construct a warehouse at 603 North Calvert street, to be built for the Independent Casket Company. The building will be 24 x 100 ft., five stories, and will be equipped with elevators, electric lights and steam heat. It was erroneously stated in *The Iron Age* of August 3 that this contract had been awarded to Morrow Bros., Inc., Baltimore.

The Elkan-Tufts Construction Company, Baltimore, Md., has been organized with a capital stock of $25,000 to do a general contracting business. Mortimer M. Elkan, Arthur Tufts and R. Barry Tufts are the organizers.

Chicago

CHICAGO, ILL., August 8, 1911.

With the exception of a machinery list from the Chicago & Northwestern Railway amounting to about $12,000, current requirements pending are very light. The International Harvester Company is expected to be in the market for additional tools in the near future to the value of $20,000. Floor sales reported are scattering and of minor importance. The general trade has been quiet.

The Felt & Tarrant Mfg. Company, Chicago, maker of the Comptometer adding and calculating machine, is putting up a large addition to its plant at 1713-1735 North Paulina street, which will require additional machinery equipment. The power equipment will include two additional horizontal tubular boilers, 44 in. x 16 ft., and a direct-connected, high-speed, 125-hp. engine. The present system of individual motor drive will be extended through the additional capacity.

The Barry Automatic Specialty Works, Chicago, has been incorporated with a capital stock of $10,000 by Henry Barry, Charles E. Boughner, William A. Jennings, and others, for general manufacturing purposes.

The Kling Bros. Engineering Works, Chicago, has been incorporated to manufacture and deal in machinery, metals and metal products. The incorporators are Charles Kling, E. N. Bessee, and Jacob J. Ludwig, and the capital is $250,000.

The W. A. Paterson Company, Chicago, has been incorporated for the manufacture of gasoline and electric automobiles.

The Imperial Brass Mfg. Company, Chicago, is about to build a six-story brick factory on South Center avenue, to cost $90,000.

The Chicago Great Western Railway, Chicago, is about to build a five-stall roundhouse at Dubuque, Iowa.

The Crane Company will build a brass foundry, five stories, of brick on North Desplaines street, Chicago, to cost $90,000.

The Cyclone Fence Company, Waukeegan, Ill., is contemplating the erection of a factory adjoining its present plant at an estimated cost of $100,000.

The Wabash Railroad has awarded contracts for the erection of a new machine shop at Decatur, Ill. The new building will be 75 x 168 ft.

The Stevens Mfg. & Foundry Company, Decatur, Ill., has been incorporated with a capital stock of $75,000 to do a general manufacturing business. The incorporators are Samuel J. Dietz, Charles W. Dietz and Willard C. Rowe.

The Southern Illinois Steel & Foundry Company, Carlinville, Ill., has been incorporated with $100,000 capital stock to manufacture iron and steel articles. The incorporators are T. P. Ross, A. G. Dohn and J. Peebles.

The Stover Engine Works, Freeport, Ill., has purchased 20 acres of land on which it contemplates the erection of an entirely new plant. In this connection the company states that despite comparatively recent additions to present foundry and machine shop, which gives the plant a capacity of 1200 engines per month, there has been no time since the first of the year that the plant has not been from 1000 to 2000 engines behind on orders. It is expected that building operations will be commenced in the fall.

The Grafton Iron Foundry, Grafton, Wis., was injured by fire to the extent of $40,000.

The Volrath Company, Sheboygan, Wis., will add to its present plant an addition, 60 x 80 ft., and three stories. The building will include a machine shop, foundry, power house and receiving department.

The Standard Aluminum Company, Manitowoc, Wis., will erect an aluminum factory in that city.

The Chamberlain Machine Company, Waterloo, Iowa, is about to enlarge its machine shop.

The Kretschmer Mfg. Company, Dubuque, Iowa, together with the Spahn & Rose Lumber Company, suffered the loss of $140,000 to its plant by fire.

The Northey Mfg. Company, Waterloo, Iowa, is building an addition 65 x 130 ft., which will cost, together with new machinery to be installed, in the neighborhood of $20,000.

The Indiana Dye Casting Development Company, Indianapolis, Ind., has been incorporated with a capital stock of $100,000. The directors are E. E. Gates, J. L. Baker and W. P. Herod, all of Indianapolis. The company contemplates the erection of a plant as soon as a suitable site is obtained, but expects to buy and install machinery in temporary quarters meanwhile.

The South Bend Pulley Company, South Lafayette street, South Bend, Ind., has just completed an addition to its factory, 65 x 75 ft., and one story.

The Indiana Steel & Iron Company, Linton, Ind., has been organized with a capital stock of $150,000. The directors are M. K. Frank, J. D. Karasik, Algernon Granville, and S. R. Sobel, of Pittsburgh, and W. J. Hamilton, of Linton.

The Wire Specialty Machine Works, South Bend, Ind., has been incorporated with a capital stock of $40,000. Gerald Mahoney, Marian Campbell and Thorvald Hansen have been elected directors.

Detroit

DETROIT, MICH., August 8, 1911.

The demand for machinery in the local market shows little change, dealers reporting a fair amount of business. The automobile trade is still the center of activity and several of the large accessory manufacturers are reported to be planning the purchase of equipment in the near future, and there has, in fact, been some small business from this source the past week. Quite a call for contractors' equipment and shop supplies has been noted recently and a good business in these lines is being done. Orders for pneumatic tools are also coming in quite freely. The market for second-hand machinery seems to be more active than for some time past, probably reflecting general trade conditions.

Building conditions are very quiet, little new work being awarded or new plans being reported, but work promises to be quite brisk a little later as there are a number of large projects on which bids have been asked and on which contracts will be awarded this fall.

Mildner & Eisen, architects of this city, are preparing plans for a large addition to the plant of the Banner

THE MACHINERY MARKETS

Brewing Company, Saginaw, Mich. The additions will include a new boiler house, rack house, wash house and stock cellars.

The Dispatch Printing Company has been incorporated with a capital stock of $3,000 by E. W. Phillips and Peter Connor.

The National Food Products Company has been incorporated by B. W. Doyle, Oscar M. Springer and Mathew Morgan, with a capital stock of $100,000.

The Wolverine Motor Supplies Company has filed notice of an increase of capital stock from $2,500 to $10,000.

The Defiance Mfg. Company, Manton, Mich., will shortly move its plant to Kalamazoo, and will erect a new factory in the latter city. The company has a capital stock of $30,000 and manufactures incubators, etc.

Following the completion of the new plant of the Lewis Spring & Axle Company, Jackson, Mich., it is announced that the Standard Electric Vehicle Company will occupy the building formerly used by the Axle Company and will equip them for the manufacture of its product, electric motor cars.

The Secret Boat Company, Bay City, Mich., is to remove its plant to Port Huron, Mich., in the near future. The company manufactures duck boats, etc.

Plans for the construction of an $80,000 addition to the Monarch Paper Mills, Kalamazoo, Mich., are being prepared. The additions will include a new coating room 86 x 248 ft., a calender room, 86 x 116 ft., and a finishing room, 68 x 123 ft. Considerable new equipment will be installed, including two large coating machines. Several additions have been made to the plant within the last two years, and the mill is now one of the largest in Kalamazoo.

The Hayes Wheel Company, Jackson, Mich., manufacturers of automobile wheels, will soon begin the erection of an addition to the present plant. The company reports an excellent volume of business.

The Grand Trunk Railway Company is planning the erection of a large new warehouse at Lansing, Mich. Among the new equipment to be installed is a hoisting crane, track scales, etc.

Fire which caused a loss of $7,000 destroyed the Stockbridge Roller Mills, Stockbridge, Mich. Definite announcement has not yet been made as to the rebuilding of the mills.

The Elliott Machinery Company, Grand Rapids, Mich., has secured larger factory quarters to take care of rapidly increasing business demands.

The Central Foundry Company has incorporated at Muskegon, Mich., giving its capital stock at $10,000.

The Clyde Produce Company, Jonesville, Mich., has taken over the kraut mill of the Le Roux Company, and proposes in connection with its new property to erect a canning plant.

The Jackson Pressed Brick Company, of Jackson, Mich., has been sold to the Jackson Sandbrick Company, of Saginaw, Mich., and will be known in the future as the Jackson Brick Company. A large amount of new machinery will be installed in the company's plant and its capacity will be doubled.

The Water Board of Flint, Mich., has awarded the contract for the construction of the new municipal filter plant to the Pittsburgh Filter Mfg. Company, at the price of $136,000. Bids for the boilers, pumps and pumping machinery to be installed in the new plant will soon be asked for.

The Cooper-Wells Company, St. Joseph, Mich., manufacturers of knit goods and hosiery, is making several additions to its plant, including a new machine shop and drying room, and will install considerable equipment therein.

The American Tool Works, St. Joseph, Mich., has been forced to convert its office into factory quarters in order to take care of rapidly increasing business.

The Board of Trade of Belding, Mich., has secured a new industry for that city in the nature of an agricultural implement factory. The city will donate a site and building to the new company. The Belding Board of Trade may be addressed.

The Shaw-Walker Company, Muskegon, Mich., has increased its capital stock from $125,000 to $150,000.

Saginaw, Mich., is practically assured of another large industry, plans being under way for the location there of a $100,000 concern, which will manufacture the Aube smoke consumer. Plans are being drawn for the new buildings and a site has been purchased. O. Aube, N. P. Bissonette and J. H. Riopelle are actively interested in the new company.

N. A. Austin proposes to erect a factory at Addison, Mich., for the manufacture of clay shingles.

The Detroit Stoker Company, Detroit, reports among other recent installations of the Detroit stokers four stokers to be installed in connection with four 500-hp. Union Iron Works water tube boilers, and three stokers to be installed in connection with three 200-hp. H. T. boilers in the plant of the Pierce Arrow Motor Car Company, Buffalo, N. Y.; also two Detroit stokers to be installed in connection with two 400-hp. Wickes boilers for the Cadillac Motor Car Company, Detroit.

Nelson Bros. Company, Alma, Mich., has arranged to move its plant to Saginaw, where a new plant will be built. The new factory will include foundry, machine shop and wood-working shop. The company specializes in gas engines and pump jacks.

The Beck Power & Spray Company, Flushing, Mich., has let contract for building a new factory to M. I. Wilcox, of Lansing.

The Lowell Specialty Company, Lowell, Mich., recently mentioned as having a plant in course of construction, states that it will be in the market soon for a full line of tinners' machinery for the manufacture of its line of compressed air sprayers, etc.

Cincinnati

CINCINNATI, OHIO, August 8, 1911.

With the exception of a slightly better inquiry from the East and from Spanish America, the machine tool situation is unchanged. In spite of press reports of rigid retrenchment on the part of several Southern railroads, a good business from that source is anticipated to commence coming in during September.

Manufacturers of internal combustion engines are very busy, due partly to the demand for marine gasoline engines for small power boats, and a local firm reports the receipt of one order calling for 500 of their different sized motors.

The Armor Steel Foundry Company expects to commence operating its plant at Winton place, Cincinnati, August 15. A number of orders for castings have been procured and the company already has tentative plans made up for making an extensive addition to the present plant. About 250 men will be employed when the foundry is in full operation. The newly elected officers are J. E. Jones, president and general manager; John W. Gebhard, vice-president; R. R. Markley, assistant treasurer, and Frank J. Stolle, sales manager. The sales offices are located in the Commercial Tribune Building.

It is announced that the Ohio Mechanics' Institute, whose new five-story home on Vine street, Cincinnati, is nearly completed, will have an industrial exhibit department, modeled along the lines of German industrial museums. The room set aside for this purpose is 30 x 150 ft., with 500 running feet of gallery space. A specialty will be made of locally manufactured products, but outside exhibits will also be accepted.

The Kinsey & Norton Mfg. Company, 610 Baymiller street, Cincinnati, has acquired control of the patents covering the Maxon track jack, formerly manufactured by the Dayton Iron Works and Boyer & Radford, Dayton, Ohio. A full line of these jacks will be manufactured in the Kinsey & Norton Company's plant.

The Fairmont Ice Company, Fairmont, W. Va., is increasing the capacity of its ice plant.

While it has not been definitely announced, it is generally understood that the Baltimore & Ohio Railroad Company will locate large repair shops on a tract of land recently acquired in Cincinnati.

The Virginia-Carolina Chemical Company, whose headquarters are at Richmond, Va., has purchased a large building site in a Cincinnati suburb, and it is reported that work on an immense fertilizer factory will be commenced at an early date.

The Split Fiber Keg Mfg. Company, Cincinnati, whose incorporation was recently noted, is fitting up the building at 1416-20 Plum street. Not all the necessary manufacturing equipment has yet been provided for.

The Scheifele Shoe Company, Cincinnati, will probably make some additions to its factory in Cumminsville suburb.

The Saxon Mfg. Company has been incorporated at Toledo, Ohio, with $10,000, to manufacture auto specialties. Herman Saxon and Chas. G. Cunningham are named among the incorporators.

The Globe Automatic Sprinkler Company is a new Ohio company, incorporated with $75,000 capital stock,

THE MACHINERY MARKETS

to manufacture automatic fire sprinklers. The factory will be located in Minneapolis, Minn., but the sales offices will be in the First National Bank Building, Cincinnati. A. B. Gould is president, A. T. West, vice-president, and W. R. Koehler, secretary and treasurer.

The Parsons Garage & Repair Company, Toledo, Ohio, is a new incorporation with $10,000 capital stock. C. W. Parsons is one of the principal incorporators.

The Safety Cylinder Valve Company, Mansfield, Ohio. has changed its name to the Triumph Valve Company.

It is reported that on account of better labor conditions in Cincinnati that the Corcoran Lamp Company will abandon its Detroit branch and do all of its manufacturing here. Mention has previously been made of proposed additions to the Cincinnati factory.

The South

LOUISVILLE, KY., August 8, 1911.

Business is noticeably improved in all lines connected with the machinery trade. Manufacturers and dealers report not only an increase in the number of inquiries, and therefore in potential business, but also in the actual number of sales. Power machinery, including electrical apparatus, is selling well, while machine tools are in better demand than has been the case for some time. A number of machine shops have been established in Louisville recently, so that this should be a better market in that direction than ever before Numerous public improvements, such as electric light plants and water systems, are being established all over the South, and equipment in this connection constitutes one of the most important factors at present.

The Victor Motor Accessories Company, Louisville, has been incorporated with $25,000 capital stock, by Alfred W. Ott and others. It has arranged to take the entire output of L. C. Young, of Cleveland, who has begun the manufacture of a self-starting device for automobiles.

Longest Bros. & Co., Louisville, have installed some additional machine tools in their auto repair shop. A drill press of the Rockford Drill & Lathe Company was among the items purchased.

The James Clark, Jr., Electrical Company, Louisville, reports a good demand for electrical equipment. Among the leading contracts recently closed is one for a 400-volt, 3-phase, alternating current outfit, including engine, generator, switchboard and motors, which is to be delivered to an ice company at Tucson, Ariz. The company notes an increase in business from the Southwest.

Charles L. V. Frank, well known in machinery trade circles in Louisville, has joined E. D. Morton & Co., and has charge of the machine tool department.

The Standard Sanitary Mfg. Company has ordered three Warner & Swasey screw machines through its local agents, E. D. Morton & Co.

The Globe Machine Company, Louisville, has been incorporated with $5,000 capital stock by Andrew B. Jutt, Richard H. Dietzman and others. The business has been conducted for some time at 704 East Main street, and no changes are contemplated.

The Crystal Laundry Company, Louisville, is building an addition to its plant at 928 West Walnut street. New power equipment is to be ordered, as well as special laundry machines.

The Louisville Railway Company has purchased a site at Twenty-ninth street and Broadway, where a car barn will be erected immediately. It is announced that following its construction the company will erect there shops for car-building purposes. Details regarding the latter have not yet been decided upon.

The health department of the city of Louisville has recommended the establishment of four garbage reduction plants. Address the Board of Public Works.

E. M. Drummond, of the Drummond Mfg. Company, manufacturer of axles, has been elected to the directorate of the Louisville Trust Company, Louisville, Ky.

The two fiscal courts interested have approved the contract whereby the Capital Construction Company, Columbus, O., is to construct a steel bridge, with concrete piers, over Salt River, near Louisville, Ky., the contract amounting to $56,000. Work is to begin at once.

The Board of Education, Louisville, is in the market for 1400 steel lockers to be installed in the Girls' High School Building.

The American Automobile Mfg. Company, New Albany, Ind., has completed the equipment of its machine shop by the installation of the following tools: Grennard arbor press, B. & S. milling machines, Landis grinder, Baker Key seater, Bullard 24 in. vertical lathe, Cleveland No. 2 horizontal boring mill, Steptoe 16-in. shaper, cylinder boring machine, 21 spindle drill press, Brandis vertical grinder, Higley cold saw, Lodge & Shipley lathe, 14 in. x 5 ft.; Henry lathe, 16 in. x 6 ft. Cincinnati No. 2 Universal milling machine; Taylor & Fenn spindle tool press and G. & E. 20-in. shaper. C. D. Norris is superintendent of the plant, which will begin turning out cars in the near future. The plant, it is stated, has a capacity of five cars a day.

The Waller Mfg. Company, Lexington, Ky., is reported to be planning the erection of an addition to its furniture factory.

The New Bluegrass Canning Company, Owensboro, Ky., which is rebuilding plant recently destroyed by fire, is purchasing a lot of equipment, including power machinery and canning machines. The boiler room will be 50 ft. x 80 ft.

The Hill Chemical Company, Cave-in Rock, Ill., is moving its plant to Paducah, Ky. George L. Hill is general manager.

J. A. Omberg, Jr., Memphis, Tenn., has received a contract from the Paducah, Ky., Traction Company for the erection of a steel and concrete bridge over Island Creek. The bid was $7,000. The piers of the bridge will be of concrete and the superstructure of steel.

The Columbia Column Company, Columbia, Ky., has acquired a building and will move its plant to Lebanon, Ky., October 1. It may add somewhat to its woodworking equipment.

W. G. Buchanan, Morganfield, Ky., is purchasing machinery for the equipment of a bakery with a capacity of 12,000 loaves a day.

E. C. Edwards, Charleston, W. Va., and George F. Miller, Huntington, W. Va., are reported to have purchased 60,000 acres of coal lands in Magoffin County, Kentucky, for $600,000. Development work is to be undertaken in the immediate future. The Lexington & Eastern Railroad is extending its line to the locality.

The Home Milling Company, Greenville, Ky., which was recently incorporated, has announced that its plant will be driven by electricity. Equipment for an elevator will be required by the company, which has begun the erection of its mill. George H. Johnston is general manager.

Ashland, Ky., is planning the construction of an independent pumping station. Heretofore the community has been served by a waterworks plant at Catlettsburg, Ky. A bond issue to provide funds for the improvement is to be voted on. Address the mayor.

Falmouth, Ky., is planning the installation of an electric light plant. A local company may be formed. Address J. W. Throckmorton.

The Fowler-Wolfe Sheet Metal Works, Paducah, Ky., has amended its articles of incorporation, increasing its capital stock.

The Nashville Armature Works, Nashville, Tenn., is adding considerable machinery to its plant. Among the items wanted are a 25-hp., 110-volt, d.c. motor and a 10-hp., 3-phase, 220-volt, a.c. motor.

A steam laundry plant is to be built at Gallatin, Tenn., by the Gallatin Laundry Company, which has been incorporated with $5,000 capitalization by D. D. Canfield, E. R. Colbert and W. H. Weakley.

The Southern Motor Works, Nashville, Tenn., has changed its name to the Marathon Motor Works and increased its capital stock to $600,000. The company manufactures automobiles.

The Rockwood Mills, Rockwood, Tenn., may construct a plant for the development of electric power with which to operate its textile mill. Final decision has not yet been reached.

Jonesboro, Tenn., is to vote on a $25,000 bond issue next month, the proceeds of the issue being intended for the construction of an interurban traction line connecting Jonesboro and Johnson City, Tenn.

The Hawkins County court at Rogersville, Tenn., has voted in favor of issuing $20,000 of bonds for the purpose of constructing a bridge over Holston River.

The Ahrens & Ott Mfg. Company, Louisville, announces the establishment of a branch store and office at Fort Worth, Texas. Full stocks of all the products manufactured and sold by the company will be carried.

The Georgia Power Company of Tennessee has been incorporated at Chattanooga, Tenn., with $100,000 capital stock. This company will handle the power

THE MACHINERY MARKETS

business developed for the plant of the Georgia Power Company at Tullula Falls, Georgia.

George T. Hood & Co., Harriman, Tenn., are asking for prices on hoisting machinery.

The Nashville Railway & Light Company, Nashville, Tenn., has purchased property which will be used ultimately for an addition to its power plant. Just when the addition will be built has not been announced.

The Forest Products Chemical Company, Memphis, Tenn., has been incorporated with $100,000 capital stock by James C. Lawrence, B. Lee Mallory and others. The company will build a plant for the purpose of utilizing the refuse of lumber mills. Its products will be charcoal, wood alcohol and acetate of lime.

The A. G. Stivers Lumber Company, Chattanooga, Tenn., has been incorporated with $100,000 capital, by A. G. Stivers and others, and will erect a sawmill.

The Southern Saw Works, Atlanta, Ga., has taken over the American Machinery Company, of that city. A new corporation has been formed under the name of the Southern Saw & Machinery Works. The company will manufacture wood-working machinery and will also deal in general machinery lines. N. S. Boyd is president of the company; J. Edward McGuire, Secretary-Treasurer, and Frank B. Baldwin, factory manager.

The Morrillton, Light & Power Company, Morrillton, Ark., will install machinery to generate 150 kw. additional power. A Corliss engine is included. W. L. Morse is president of the company.

An electric plant will be built by the Reform Ice & Light Company, of Reform, Ala. John Newell is general manager of the company.

The Dixie Culvert & Metal Company, Atlanta, Ga., has completed the erection of a new factory for the manufacture of road culverts and other sheet iron products.

The Board of Bond Trustees, South Jacksonville, Fla., will open bids August 24 for furnishing approximately 5 miles of 4-in. cast iron pipe drilling well, furnishing pumps, generator, exciter, switch board, etc.

The Carolina Metal Products Company, Wilmington, N. C., has been organized to establish a plant for the manufacture of metal culverts, etc. Thomas A. Empie, Wilmington, N. C., is president of the company.

St. Louis

ST. LOUIS, MO., August 7, 1911.

There is a dearth of information in the machine tool market this week, for little has transpired to give the situation character. There have been few inquiries of moment nor have there been any sales to justify giving the market any different tone from that which has prevailed for so many months. Dealers are still hopeful that the fall will improve matters, but they admit having no material evidence of such prospects at present.

The Peroxident Specialty Company, Cincinnati, has bought ground for a factory at Etzel avenue and the Wabash tracks, in the western part of the city, and will erect a factory for its business, which it will remove to St. Louis. The buildings will include two-story shipping and laboratory structures to cost $40,000.

Permits have been taken out for the reconstruction of the planing mill buildings of the Huttig Sash & Door Company, burned recently. The new plant will be larger and better than the old. The buildings are to cost about $150,000. The machinery equipment has not been ordered yet.

The Shelbyville Gas Company has been organized at Shelbyville, Ill., with $30,000 capital stock, and will instal a gas-making and distributing plant. The capital will be increased later as the work progresses.

The American Paper Goods Company has optioned a site here for a branch factory of its Kensington, Conn., plant and will, probably, equip a plant for the manufacture and distribution of its products in the St. Louis territory.

The Liberty Foundry Company has been incorporated here and is arranging to start a plant for the manufacture of attachments to wagon wheels and axles, preventing the loosening and loss of nuts.

The Stahl Incubator & Mfg. Company has been incorporated at Quincy, Ill., with $25,000 capital stock, for the manufacture of incubators and other poultry and farm devices. The incorporators are George H. Stahl, George W. Govert and John O. Glenn.

The Mathews-Davis Tool Co., which has bought ground for a new factory, will increase its plant to about double its present capacity. It will occupy a building 40 x 125 ft., two stories, and will be devoted to the manufacture of the Davis expansion boring tool.

A site for the White River dam, authorized by Congress at its last session, to be used for the development of water power, is being selected by engineers now testing the flow and other conditions. It will furnish electric light and power for Springfield, Mo., primarily, and other cities of southern Missouri.

The Buck Head Rice Co. has been chartered with $100,000 capital at Hickory Ridge, Ark., for the purpose of installing rice mills at that and other points in Arkansas. It is a subsidiary of the same company of New York City.

The Western Wheelbarrow & Mfg. Company has been incorporated at Fort Smith, Ark., with $200,000 capital stock, to manufacture wheelbarrows and other similar vehicles. J. G. Dade and J. P. Ellison, of Kansas City, Mo., and John C. Gordon, of Fort Smith, are the incorporators.

The Chillicothe Iron Company, Chillicothe, Mo., has been organized to take over the property of the Chillicothe Foundry & Machine Company, and new shops will be built on the site of those destroyed by fire.

H. P. Miller, Commissioner of Water Works, Topeka, Kan., is receiving figures covering the installation of a 10,000,000 gal. compound condensing water pump.

Texas

AUSTIN, TEXAS, August 5, 1911.

An unusually large demand for machinery for waterworks and other municipal plants in Texas and the Southwest is expected this fall. Tentative plans are on foot for the installation of many improvements of this character. The rapid growth of towns in Southern Texas, as well as in Western Texas, is causing much attention to be given to providing them with these necessary public utilities. There are also a large number of electric street railway and interurban projects on foot which will require considerable machinery if they are brought to a point of consummation.

The Farmers' Union Ware House & Gas Company has been formed at San Saba, with a capital stock of $10,000. Incorporators are J. H. Hylander, James Burns and J. N. Graham.

The proposition of Wm. D. Johnson, of Hartford, Conn., head of the Hydraulic Properties Company of New York, for the construction of a dam across the Colorado River at Austin and the installation of a hydro-electric plant, will be voted on by the people of the city on August 30. The proposed cost is $1,600,000.

The Alvin Light & Power Company has let the contract to Lovegrove and Wyman, of Houston, for the installation of a complete waterworks system at Alvin, Texas.

The Farmers' Electric Gin & Ice Company has just been formed at Greenville, to erect a cotton gin and ice plant. Charles M. Dollins is interested.

The Columbia Oil Tank Company has been formed to do business at Texarkana, Texas. It has a capital stock of $75,000.

The $85,000 of bonds that were recently issued by the town of Greenville, for extending the waterworks system, have been approved by the attorney general, and the important work will soon be started.

The Medina Irrigation Company, headed by Dr. F. S. Pearson, of New York, has enlarged its plans for irrigating lands in different parts of South Texas. The cost of the dams and canal system, near Kerrville, will be approximately $2,000,000. He has also filed on the water rights of the Frio and Nueces rivers, in Uvalde County, and two or more large dams will be erected across those streams to form water storage reservoirs. The original estimated cost of the irrigation and hydro-electric works that were to be installed by the Medina Irrigation Company was $6,000,000. The enlarged plans, however, bring this estimate of cost up to $12,000,000.

The large power house at League City, of the Galveston-Houston Interurban Railway Company, is finished and the machinery has been given a successful tryout. The construction of the line between Houston and Galveston is well advanced and will be finished before the causeway across Galveston Bay is completed.

J. F. Strickland, of Dallas, president of the Southern Traction Company, says that satisfactory progress is being made in the preliminary work for the construction of an interurban electric railway between Dallas, Waco and Corsicana.

THE MACHINERY MARKETS

It is announced by Corrigan, Lee & Halpin, who have the contract for the construction of the giant steel and concrete viaduct to connect Dallas with Oak Cliff, spanning the Trinity River, that it will be finished by December 1. It is claimed that this viaduct is the largest of its kind in the world.

The Texas Company, Houston, has applied to the City Commission of Dallas for a franchise for laying a system of oil mains in that city whereby consumers of fuel oil may be supplied from the company's refinery direct to their plants.

The City Commissioners of Waco will open bids August 22 for the sale of $200,000 of bonds, proceeds to be used for extensions of the sanitary and storm sewers, opening streets and making improvements to public school buildings.

The Mexico Light & Power Company has completed the installation of two additional 10,000 kw. units in its great hydro-electric plant at Nexaca, Mexico, and they are said to be giving satisfactory service. The new water storage dam, which the company is constructing, will soon be finished. It and other reservoirs have been filled by the recent rains.

The Peden Iron & Steel Company has acquired a site at Houston, upon which it will erect a large addition to its plant. It is stated that this addition will have a capacity larger than the present plant.

The Pacific Coast

SAN FRANCISCO, CAL., August 4, 1911.

Machine tool business has fallen off somewhat toward the end of the month. No orders of any consequence whatever are being placed by shops in the vicinity of San Francisco, and there seems to be little prospect of business in this district for some time to come, as many local machine shop operators take a rather pessimistic attitude. Occasional purchases are made for shops in the interior of the State, but most of the business at present is coming from southern California and the oil fields. Orders on a small list for the Southern Pacific Railroad have been about equally divided among several firms.

Woodworking machinery remains quiet, and very little contractors' equipment is moving in the local market, though occasional inquiries are received from other parts of the State, and considerable buying in miscellaneous lines is being done by the mining interests. The movement of small pumping units is well sustained, and a few pumping outfits of fairly large size are being built, though no orders of unusual importance have been placed recently.

Manning, Maxwell & Moore are opening a branch office in Los Angeles, under the management of L. H. Bailey. The new branch will be under the direction of the San Francisco office, Louis G. Henes, manager. The E. P. Jamieson Company, Seattle, Wash., representing numerous lines of machinery and contractors' supplies, is preparing to carry a large stock in connection with the San Francisco office, which has formerly taken orders only for shipment from the factories or the Seattle warehouse.

The Norman B. Livermore Company now has the new boiler shop at its South San Francisco plant in full operation, with a full equipment of Hilles & Jones tools. The company is filling some good car orders, and has considerable locomotive repair work on hand.

The city of Los Angeles will receive bids August 14 for a drag-line excavator, and on August 13, for 40 tons of chrome steel balls.

The city of Los Angeles is taking figures on a large amount of dredging. It is not yet known whether any large amount of new machinery will be required. The Standard American Dredging Company has a large dredge under construction for work at that point.

The Southern California Gas Company has purchased a large site near Colton, Cal., on which a plant will be erected to supply gas to San Bernardino, Redlands, Riverside and Colton.

It is reported that the Great Western Power Company will start work on three new hydroelectric plants early in 1913, when the dam at Big Meadows is due to be completed. With the present equipment at Las Plumas, the new installations will give the company a capacity of about 500,000 hp.

The Pacific Gas & Electric Company is planning to install a hydroelectric plant of about 70,000 hp. capacity in South Yuba River canyon.

The Western Cutting & Welding Works has been incorporated in San Francisco, with a capital stock of $20,000, by F. W. Clifford, J. Gottstein and M. Fisher.

The town of Dorris, Cal., will receive bids August 25 for the installation of a complete waterworks system.

A new hoisting plant is to be installed shortly at the Burlington mine, near Oroville, Cal., and the management is planning to put in a 100-ton ore mill.

The Bessemer Gas Engine Company will complete the installation of eight 80-hp. compressors for the Honolulu Consolidated Oil Company, in the Bakersfield District, about the middle of the month. The oil company is working on a project to produce gasoline from natural gas.

The Parker Machine Works, Riverside, Cal., has a contract for a lot of fruit-handling machinery for the Riverside Heights Fruit Association.

The Santa Ana, Co-operative Sugar Company, Santa Ana, Cal., has placed an order with a Cincinnati firm for a beet mill with a daily capacity of 600 tons.

The Llewellyn Iron Works has taken a contract amounting to $33,250, for passenger elevators in the Union Oil Building at that city.

The San Francisco office of the Bucyrus Company has taken orders for three drag-line excavators, with 100-ft. booms and 3½-yard buckets. Two are for the Natomas Consolidated of California, and one for Miller & Lux. The Natomas Consolidated has also ordered a 40-yard Bucyrus steam shovel, and the Bucyrus Company is building machinery for the dredge Natomas No. 10, having a bucket capacity of 15 cu. ft. The Bucyrus Company also has the order for a 9 cu. ft. dredge, complete, for the Union Dredging Company, operating near Folsom, Cal.

The Taylor Foundry & Engineering Company, Grass Valley, Cal., is building a large pumping plant for the Providence mine, Nevada City, Cal.

Western Canada

WINNIPEG, MAN., August 5, 1911.

Harvest operations now begin to monopolize the interest of Western Canada. If the crop is got off without mishap it will be almost double the return of the largest crop previously grown in that part of the country. There are some indications of a holding back of orders in certain lines until the general election of September 21 decides the fate of the reciprocity agreement.

C. F. Caldwell, manager of the Utica Mine, near Kaslo, B. C., left for Duluth some days ago, where he will confer with directors about the purchase of machinery for a concentrator plant and tramway on the property.

The Blowey-Henry Company, Edmonton, Alberta, is erecting a five-story warehouse at that point.

P. Burns & Co., Calgary, Alberta, are about to begin the construction of a large meat-packing plant at Edmonton.

John Reid, Sons & Co., Glasgow, Scotland, are establishing a branch factory in Calgary, Alberta.

Apparatus for the carrying out of the construction contracts secured by Foley Bros. and the Northern Construction Company on the Canadian Northern Railway is being brought from the United States, and is now being assembled at Spokane for the Eastern work, which the contractors have undertaken for $16,000,000. The other section is north of Lake Superior and Lake Huron and will cost $12,000,000. Twelve thousand hands will be employed.

A modern coal-handling plant, with a retaining capacity of 20,000 tons, is being built and equipped at Fort William, Ont., by James Murphy.

The Industrial Commissioner of Calgary, Alberta, states that he has been advised by Morris & Co., pork packers, Chicago, that they will this autumn begin the erection of a $3,000,000 packing plant in Calgary. It is also rumored that Armour & Co. are considering the idea of establishing a Canadian packing plant at Calgary.

The contract for the construction of the match factory, which R. B. McArthur has been promoting in Port Arthur, Ont., is to be let about August 15.

The Alberta Foundry & Machine Shop Company, Medicine Hat, Alberta, began operations on July 25.

The Canada Malting Company expects to begin the construction of a plant in Calgary, Alberta, this autumn.

MacKissock & Thomas, Winnipeg and Calgary, have the contract to erect a warehouse at Calgary, Alberta, for John Dure Plow Company.

THE MACHINERY MARKETS

Large power gasoline traction engines have been much in demand in the Canadian West this summer.

A company has been formed to manufacture beet-sugar at Strathmore, Alberta. Its principal members are Calgary men. J. S. Dennis, of the Canadian Irrigation Company, is president. The factory is expected to cost about $1,000,000.

L. B. de Laitte, a French inventor, is arranging to establish in Vancouver a plant in which to manufacture his gas machines.

The city of Brandon has under consideration a recommendation of its engineer to install a sedimentation basin of 4,680,000 gal., to be filled by a centrifugal pump.

Tenders will soon be called for by the town of Wetaskiwin for a steam pump, a steam compressor and a vaporization gas engine.

The town of Wilkie, Sask., will receive up to August 21, tenders for one 60-kw., 3-phase, 60-cycle, 2200-volt a.c. generator; one exciter for above; switchboard, switches; three 2200-volt motors back geared to pumps; five transformers for lighting system; one 100-hp. internal combination engine. Pumping machinery; one working head and deep-well cylinder; one 250,000-gal. pump; one air compressor, necessary shaftings and belting. One pneumatic storage tank. A large amount of wire, c.i. pipe, etc.

Wallace Shipyards, Ltd., will rebuild plant destroyed by fire at North Vancouver, B. C.

The city of Camloops, B. C., will spend $200,000 in developing a power plant at Barrier River.

The Maple Leaf Milling Company, Brandon, Man., requires machinery for a new elevator.

Griffiths Electric Contractor, Ltd., Winnipeg, has been incorporated with a capital stock of $500,000 to carry on business as manufacturer of electrical apparatus, etc.

Lucas Patent Granitic Pipe & Cement Construction Company, Victoria, B. C., is incorporated with a capital stock of $100,000.

United Lumber & Shingle Mills, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $100,000.

Eastern Canada

TORONTO, ONT., August 5, 1911.

It is expected that the opening of the general election campaign in this country will be followed by the placing of several government contracts of large magnitude. The awarding of such contracts at such a time is in accordance with long-established precedent and practice. Improvements of the government's Intercolonial Railway, calling for the expenditure of millions upon terminal facilities at St. John, N. B., the letting of the Hudson Bay Railroad contract and other large undertakings, not to mention the very numerous local public works always provided for at such times—all these things will call for heavy disbursements from the Dominion treasury. One important work which the government may think better than to award before the election is that for the construction of its naval vessels at an estimated cost of about $15,000,000. The navy is an issue in this election, especially in Quebec, the province in which the Laurier government is strongest. To award the contract now would be certain to strengthen the Nationalists in that province. Business throughout the country is better than it usually is at harvest time. A class of machinery for which a demand is expected to spring up in the near future in Ontario is that for the applying of electrical power to farm processes. Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, has brought back with him from Germany samples of various forms of electrical apparatus, and, as legislation was put on the statute books last session providing for the supplying of power to the farmers by the commission, a large demand for such apparatus is to be looked for.

O'Keefe & Drew are building an abattoir plant in Harwich township near Chatham. A large number of families are being brought from Iowa to supply labor for the new plant.

The Hamilton Bridge Company is building several steel bridges on the Canadian Northern Railway Company's new line between Toronto and Ottawa.

The Taylor-Forbes Company, Guelph, Ont., is installing an electric power service in its works.

The Dome Mining Company, Porcupine, Ont., has ordered a new machinery equipment to take the place of that destroyed in the forest fire. The order amounts to about $200,000. Machinery will also be required for the adjoining West Dome mine.

C. Poirier, of the Vipord Mining Company, Porcupine, Ont., has been in New York to purchase a plant for the mine to take the place of that destroyed in the forest fire.

The Wayagamac Pulp & Paper Company, whose mill is under construction at Three Rivers, expects to commence the manufacture of paper on a very large scale in October.

The Canadian Fairbanks Company, with its head office in Montreal and branches throughout the Dominion, and the Fairbanks-Morse Canadian Mfg. Company, with head office in Toronto, and its subsidiary companies, the Dominion Safe & Vault Company, Farnham, Quebec, and the E. & T. Fairbanks Company, Sherbrooke, Quebec, have amalgamated and the new company is to be known as the Canadian Fairbanks-Morse Company. The president of the new concern will be H. S. Fuller, of Montreal, president of the Canadian Fairbanks Company, and the vice-president, P. C. Brooks, of Toronto, president of the Fairbanks-Morse concern. The capital stock of the new company is to be $2,600,000.

The plants of the United Construction Company and the Ottawa Stone & Brick Company, Ottawa, were damaged by fire on Monday to the extent of $10,000.

It is stated that the American Cash Register Company, Columbus, Ohio, has under consideration the idea of building an assembling plant in Windsor, Ont., in the event of its locating in Detroit.

The Standard Chemical & Lumber Company, which operates a plant at Fenelon Falls, Ont., proposes to establish works at Bancroft, Ont., to cost $150,000.

The Montreal Board of Control has decided to call for tenders for the supplying of five automobile fire-fighting machines and two of the latest improved steam pumps.

Damage to the extent of $30,000 was done by fire August 2 to the stock and plant of the St. Lawrence Pulp & Paper Company, Ottawa, Ont.

The city of Hamilton has decided to install impellers at the Beach pumping station, the offer of the McDougall firm, Montreal, being accepted.

Robert Beirs, manager director of the Cammell-Laird Company, ship builder, England, has announced that, if pending negotiations are successful, a ship yard will be built at St. John, N. B., for the building of Canada's warships by a firm to be established in Canada, though organized and developed by a British company.

W. A. Morr & Co., Millview, Halifax, N. S., have awarded a contract for the building of a $75,000 mill.

The Grand Trunk Pacific Railway Company will shortly call for tenders for the construction of shops at Quebec to cost about $2,000,000.

The Dominion Flour Mills Company, Brantford, Ont., requires machinery for plant.

The Brandon Brick & Tile Company is building a plant at Milton, Ont.

The Sweet Machinery & Foundry Company, North Bay, Ont., will locate a new plant at Cobalt, Ont.

Work is about to be begun on a $200,000 factory at Orillia, Ont., for the Tudhope Carriage Company.

The Preston Woodworking Machinery Company, Preston, Ont., is calling for tenders for the supply of planers, lathes, drills, shapers, milling machines, gears, cutters, screw-cutting machines, key-seating machines, tumbling mill girders and hydro-electric power equipment, the total to cost about $20,000.

The Baine Wagon Company, Woodstock, Ont., will shortly give out the contract to build there an additional factory to cost $25,000.

The Oxford Knitting Company, Woodstock, Ont., is preparing to erect an additional factory there to cost $30,000.

The Independent Tire Company, Guelph, Ont., has awarded the contract for the construction of a factory building to cost $47,000.

M. H. Baker, city engineer, St. Thomas, Ont., will receive tenders up to August 19 for the supplying of a 6,000,000-gal. centrifugal pump and steam engine.

The Tudhope Knox Company, Orillia, maker of steel trucks; the Perrin Plow & Stove Company, Smith's Falls, maker of plows, stoves, etc., and the Tudhope Anderson Company, Winnipeg, selling agent, having agencies at Winnipeg, Regina, Calgary and other large centers in western Ontario, have formed a merger. They have also acquired the West Lorne Wagon Company. F. R. Oliver, of the Perrin Plow

THE MACHINERY MARKETS

& Stove Company, will move to Orillia, where Perrin plows will be manufactured in future. The Smith's Falls' plant will be enlarged and devoted wholly to the manufacture of stoves.

The Rudel Belknap Machinery Company, Montreal, has been incorporated with a capital stock of $40,000.

The National Spring & Wire Company, Albion, Mich., has made arrangements with the town of Windsor, Ont., to move its plant from St. Catharines to Windsor.

Government Purchases

WASHINGTON, D. C., August 7, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 22, under schedule 3807, for one 12-hp. gasoline engine and schedule 3806, one cut-off machine and one cut-off saw.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 5, under schedule 3803, for delivery to Mare Island, Cal., as follows: One sensitive drill, one emery grinder, one gap lathe, one tool room lathe, one shaping machine, one arbor press, one drill press.

The constructing quartermaster, Portland, Maine, will open bids August 15 for the construction of pump house, tank, installation of pumping machinery, piping, etc.

The Paymaster-General, Navy Department, Washington, will open bids August 15, under schedule 3800, for fourteen electrically driven forced draft blowers.

Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 29, under schedule 3820, for three automatic turret machines, for delivery to Washington, D. C.

Bids were opened August 1 by the Bureau of Supplies and Accounts, Navy Department, Washington, for material for the navy yards as follows:

Schedule 3751, class 51, one steam hydraulic forging press—Bidder 14, Bethlehem Steel Company, South Bethlehem, Pa., $5,455; 33, Camden Iron Works, Camden, N. J., $8,800; 156, United Engineering & Foundry Company, Pittsburgh, Pa., $7,720; 166, Mesta Machine Company, Pittsburgh, Pa., $4,800.

Schedule 3767, class 71, one sawdust exhausting and collecting system—Bidder 1, Allington & Curtis Mfg. Company, Saginaw, Mich., $935.30; 136, Sterling Blower Company, Hartford, Conn., $835 and $685; 146, B. F. Sturtevant Company, Hyde Park, Mass., $885 and $906.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

Buyer's Duty to Inspect.—A buyer of wheelbarrows is bound to inspect them on delivery, and failure to reject those not complying with the order waives any claim that they are not of the quality and character ordered. But this rule does not apply if there has been no opportunity for inspection or an inspection is prevented by acts of the seller, agreement between the parties or a custom of trade. (New York Supreme Court, First Appellate Division, Motley Green & Co. vs. Elmenhorst, 127 New York Supplement 625.)

Validity of Preference of Creditors by Insolvent.—Before a trustee in bankruptcy can recover money paid by the bankrupt, as an unlawful preference, he must show that the creditor receiving it had reasonable cause to believe that the bankrupt was insolvent when the payment was made and that the payment was made with intent to defeat the bankrupt law. There is no unlawful preference, though the debtor be hopelessly insolvent, if the creditor accepts only that part of his debt to which he would be entitled if all the property liable to the debtor's debts should be apportioned among his creditors. (Alabama Supreme Court, Herzberg vs. Riddle, 54 Southern Reporter 635.)

Effect of Contract to Grade Land as Part of Lease.—A lessee's obligation to "grade" land from a certain avenue to a dock requires it to "uniformly" grade the land. (United States Circuit Court, Southern District of New York, Susswein vs. Pennsylvania Steel Company, 184 Federal Reporter 102.

Prerequisites to Rescission of Contract for Breach of Warranty.—If a buyer desires to rescind a contract of sale on the ground of breach by the seller of an express or implied warranty of quality, he must return or offer to return the things bought within a reasonable time, unless they are wholly worthless. (Texas Court of Civil Appeals, Mineral Wells & Lakewood Park Street Railway Company vs. First National Bank of Chicago, 133 Southwestern Reporter 1099.)

When Employee Does Not Assume Risk of Injury.—An employee does not assume the risk of injury through proximity of another machine to the one which he operates, where his employer has assured him that the condition is not dangerous, but that the machine will be removed the next day, if the employee reasonably believes that by proper care he can avoid injury. (Springfield, Missouri, Court of Appeals; Holman vs. E. E. Souther Iron Company, 133 Southwestern Reporter, 379.)

Liability for Injury to Employee.—A member of a rivet gang engaged in structural iron work is not a fellow servant of another workman employed to pile steel beams, as affecting the common employer's liability for injury to one caused by the negligence of the other. The general rule that an employer is not responsible for negligence of a foreman causing injury to a workman unless the foreman was authorized to employ or discharge does not extend to a foreman giving orders to workmen placed under his control. A manufacturer is liable for injury to an employee directed to pick up scraps of iron between piles of steel beams, caused by negligently piled beams falling upon him. (Texas Court of Civil Appeals, Mosher Mfg. Company vs. Boyles, 132 Southwestern Reporter, 492.)

Duty to Warn Employee Against Danger.—An employer is liable for death of an employee caused by his drinking solution of cyanide of potassium from a hose which was ordinarily connected with a water supply pipe and used by the workmen for drinking purposes, where specific warning was not given of the detachment of the hose from the water pipe and its connection with the tank containing the solution. It was a question for the jury to determine whether direction to the employee not to go down for wash water that night because the superintendent was running a solution over into a tank was sufficient warning of the change made. (Wisconsin Supreme Court, Fidelity Trust Company vs. Wisconsin Iron & Wire Works, 129 Northwestern Reporter, 615.)

Rights Concerning Trademarks.—Whether unfair competition by imitating labels or marks exists is tested by the question whether, when they are not side by side, an ordinarily prudent purchaser would likely purchase the one believing that he was purchasing the other; and not whether a difference can be recognized when the competing articles are placed side by side. One manufacturer cannot create a monopoly to be enjoyed by him by adopting a shape or form of product, and particularly when such product is one in general use. And this is emphasized when such product is made from material which is fashioned for its better use, and with better economy for use, according to long-time usage. (United States Circuit Court of Appeals, Eighth Circuit; A. Y. McDonald & Morrison Mfg. Company vs. H. Mueller Mfg. Company, 183 Federal Reporter, 972.)

Effect of Accepting Insurance Policy.—In the absence of fraud or misrepresentation, one who accepts an insurance policy and retains it without objection is bound by its terms, though they are not in accordance with the application or the agreement made in the preliminary negotiations. (United States Circuit Court, District of South Carolina; United States Casualty Company vs. Charleston Mining & Mfg. Company, 183 Federal Reporter, 238.)

Right to Recover Payment Made Under Mistake.—A payment voluntarily made can be recovered on the ground of mistake only when the mistake is one of fact as distinguished from a misconception as to one's legal obligation. Hence, a corporation cannot recover overpayment under a contract for electric power, arising from the company's electrician's erroneous computation of power furnished at a higher rate than the contract called for, where his mistake occurred through misconstruing the effect of the agreement. (New York Court of Appeals, Payne vs. Witherbee, Sherman & Co., 93 Northeastern Reporter, 954.)

Measure of Damages for Breach of Contract to Repair Machinery.—One who fails to comply with a contract to repair machinery, resulting in the owner being prevented from operating his plant in whole or in part, is chargeable with the rental value of the plant or so much thereof as was put out of operation by the breach of contract. (Georgia Court of Appeals, Thornton & Warren vs. Cordell, 70 Southeastern Reporter, 17.)

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:	
1 to 1⅛ in. round and square	₩ lb 1.70¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.70¢
1½ to 4 in. x ⅛ to 5-1	₩ lb 1.80¢
Rods—⅜ and 11-16 round and square	₩ lb 1.80¢
Angles:	Cts. ₩ lb.
3 in. x ¼ in. and larger	1.90¢
3 in. x 3-16 in. and ⅛ in.	2.30¢
1½ to 2½ in. x ⅛ in.	2.05¢
1½ to 2½ in. x 3-16 in. and thicker	1.95¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅞ x ⅛ in.	2.20¢
¾ x ⅛ in.	2.25¢
⅝ in. x ⅛ in.	3.45¢
½ x 3-32 in.	3.90¢
Tees:	
1 in.	2.35¢
1¼ in.	2.20¢
1½ to 2½ x ¼ in.	2.00¢
1½ to 2½ x 3-16 in.	2.10¢
3 in. and larger	2.95¢
Beams	1.90¢
Channels, 3 in. and larger	1.90¢
Bands—1¼ to 6 x 6-16 to No. 8	2.10¢
Burden's "H. B. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer machinery	1.90¢
Toe calk, tire and sleigh shoe	2.50@3.00¢
Best cast steel, base price in small lots	7¢

Sheets from Store—

Black

	One pass, C.R. soft steel.	R. G. cleaned.
No. 16	₩ lb 2.45¢	2.75¢
Nos. 18 to 20	₩ lb 2.50¢	2.85¢
Nos. 22 and 24	₩ lb 2.55¢	2.95¢
No. 26	₩ lb 2.60¢	3.05¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished &c.

Genuine Russia, according to assortment	₩ lb 12 @14½
Patent planished, W. Dewees Wood	₩ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14	₩ lb 2.75¢
No. 24	₩ lb 3.10¢
No. 26	₩ lb 3.30¢
No. 28	₩ lb 3.60¢

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₩ lb 5.50¢
No. 26	₩ lb 6.00¢
No. 28	₩ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.		Painted.	Galvd.
No. 24	₩ 100 sq. ft.	$3.75	$4.70
No. 26	₩ 100 sq. ft.	2.85	3.90
No. 28	₩ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 107 lb	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₩ lb

High Brass Rods—

List February 1, 1911. 14⅝¢ ₩ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅝¢ ₩ lb

Brass Wire—

List February 1, 1911. 14⅝¢ ₩ lb

Copper Wire—

Base price, Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₩ lb 18¢

Sheet copper cold rolled, 1¢ ₩ lb advance over hot rolled.

Sheet copper polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet copper polished over 20 in. wide, 2¢ ₩ square foot.

Planished copper, 1¢ ₩ square foot more than polished.

METALS—

Tin—

Straits pig	₩ lb 46 @47 ¢

Copper—

Lake ingot	₩ lb 14 @14⅛¢
Electrolytic	₩ lb 13¾@14 ¢
Casting	₩ lb 13¾@14 ¢

Spelter—

Western	₩ lb 6⅝@ 7 ¢

Zinc—

No. 9, base, casks	₩ lb 8¢ Open ₩ lb 8½¢

Lead—

American pig	₩ lb 5½@5¾¢
Bar	₩ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed	₩ lb 28½@28⅝¢
No. 1	₩ lb 26½@26⅝¢
Refined	₩ lb 24¾@25½¢

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb..@ 9⅝¢
Hallets	@10 ¢
Other brands	9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢
Rods and Wire Base price 31¢
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

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Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

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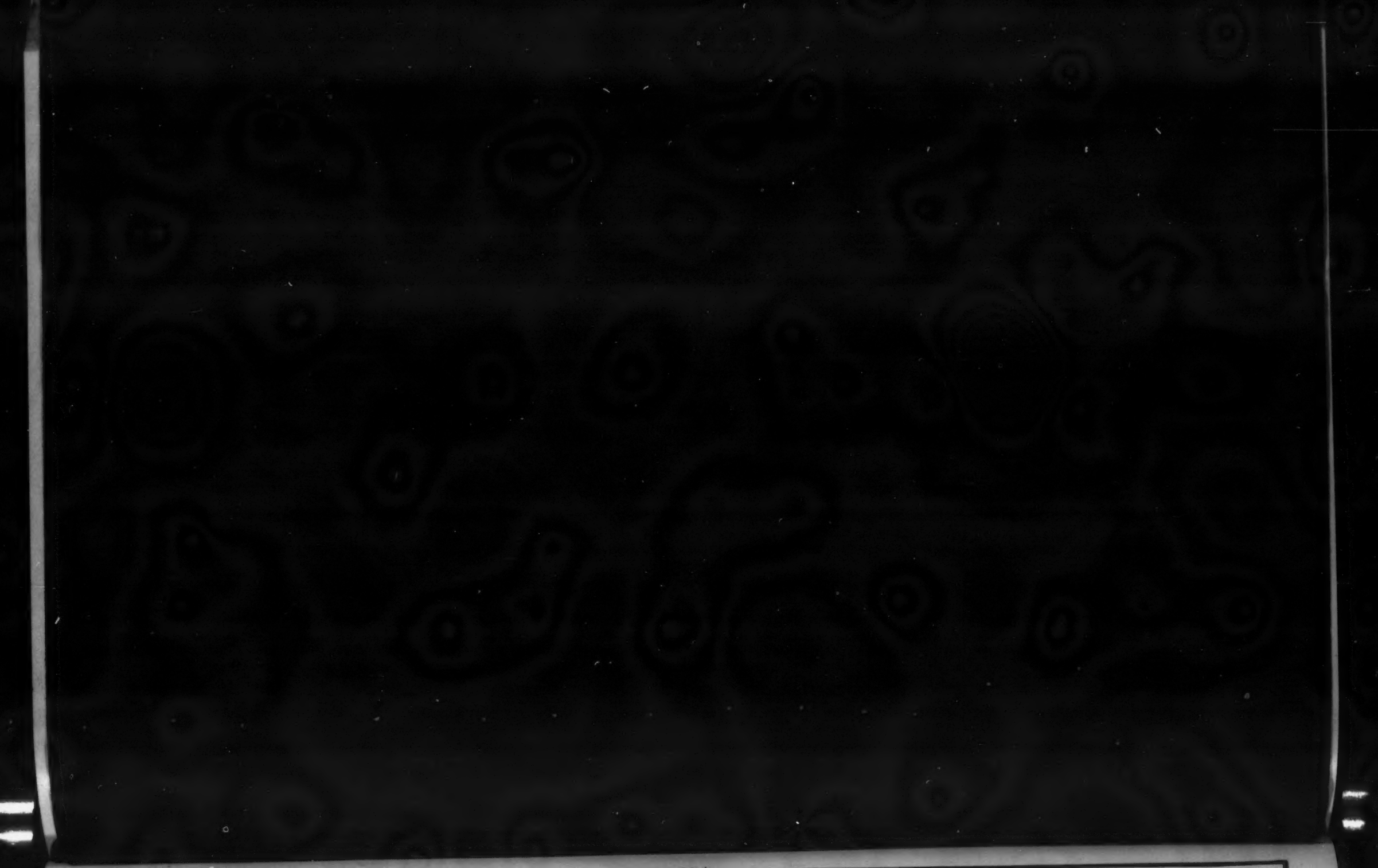
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